DOCUMENT RESUME

ED 241 146 PS 014 177

AUTHOR Black, Maggie, Ed.
TITLE Technology: Appropriate for What? And for Whom?
INSTITUTION United Nations Children's Fund, New York, N.Y.
PUB DATE 83
NOTE 37p.
PUB TYPE Collected Works - Serials (022)
JOURNAL CIT UNICEF News; Issue 117/1983/3

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Developing Nations; Employment; *Family Life; Females; Food; Foreign Countries; Fuels; Program Effectiveness; Recycling; *Rural Areas; Rural Development; Solar Energy; *Technology; Water Quality
IDENTIFIERS Africa; Bangladesh; Development Education; El Salvador; India; Mozambique; Nepal; Senegal; Somalia; Stoves

ABSTRACT

Included in this issue of UNICEF News are several brief articles focusing on the theme of appropriate technology. Topics discussed include (1) the improvement of family life through the scientific application of appropriate technology; (2) UNICEF and the household fuels crisis; (3) the workload of African women; (4) ways energy, food, health, and agricultural needs can be and have been met as a result of technological innovation; (5) difficulties in constructing a solar still in Somalia; (6) the refinement of existing waterpump technology in Bangladesh; (7) use of scrap materials as teaching aids by educators in Mozambique; (8) low cost, resource-saving technologies being used or investigated around the world; (9) attention to the needs and interests of women to improve acceptance of development programs; (10) modification of imported millet mills to improve acceptance by Senegalese; (11) the introduction of a more efficient cooking stove in Nepal; (12) the rejection of an energy-saving cookstove among "displaced persons" in El Salvador; (13) machine tools using human physical energy; (14) intermediate technology and its dissemination in developing countries; (15) developmental education in Switzerland and Japan; and (16) news about UNICEF events. (RH)

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UNICEF news

Issue 117/1983/3

Contents

TECHNOLOGY: "APPROPRIATE" FOR WHAT AND FOR WHOM?
Appropriate technology might initially have seemed like a playground for gadget-happy cranks, but its more scientific application in recent times has shown how valuable a tool it can be, especially for improving family life through the elimination of domestic drudgery. By JOHN BALCOMB. page 3

Inset:
UNICEF and household fuels page 4

THE THUD OF A THOUSAND HOES
Women in Africa are amongst the hardest-worked in the world, spending up to 16 hours a day on manual labour in the field and at home. And yet it is invariably men who end up gaining from the introduction of new forms of technology. By LINDSEY HILSUM page 7

APPROPRIATE TECHNOLOGY: THE NEEDS
The strongest argument for appropriate technology is its need. This information spread looks at how some areas of energy, agriculture, food and health would benefit from technological innovation, and other areas which already have. page 10

AN EXTRAORDINARY EXPERIMENT IN THE SUN
Innovation can be risky, and there's never any guarantee that the proposed solution will work. Such was the case at Kudha in Somalia, where a solar still designed to provide fresh water to the villagers turned out to be costly. page 12

A PUMP FOR ALL COUNTRIES
The drive for a low-cost mechanism to tap clean, safe water under the ground has borne fruit in Bangladesh, where a local engineer has refined existing pump technology to create a new hand-pump whose inexpensive manufacture will enable widespread deployment. By SAYED KAMALUDDIN. page 14

THEIR RUBBISH IS OUR PRIME MATERIAL
An Education Materials Development Group in Mozambique is pioneering the design and use of clay, bamboo and scrap metal teaching aids. But some educators, writes LINDSEY HILSUM, are still convinced that they are getting "left-overs". page 16

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Cover photograph: UNICEF 039/83/Colombia/Wolff

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UNICEF News is published four times a year by UNICEF's Information Division. To receive the magazine, please write for details to your nearest UNICEF National Committee or Field Office (see back cover for addresses).

Copies of UNICEF photos (those with ICEF numbers) can be obtained from UNICEF's Photo and Exhibition Services.

UNITED NATIONS CHILDREN'S FUND
NEW YORK, N.Y. 10017

NEW TRICKS FOR OLD TASKS
A pictorial guide to some interesting examples of low-cost, resource-saving technologies in use or being experimented with around the world. page 18

TRY ASKING THE WOMEN FIRST
Technological innovations designed to improve rural life often fail to interest the beneficiaries, in part because of lack of attention to the needs of the women who are going to be the major users. By ANIL AGARWAL. page 22

THE FLOUR DIDN'T TASTE RIGHT
The imported millet mills were expensive and difficult to maintain, but worst of all, produced flour whose taste the villagers disliked. NORBERT ENGEL describes how the Sengalese are once more enjoying their food–and saving money at the same time. page 24

SUSHILA WANTS A NEW KITCHEN STOVE
It's getting more and more difficult to gather firewood on the precarious hillsides of Nepal, so a more efficient cooking stove has its appeal–but it took a while learning how best to introduce it, writes GEORGE MCBEAN. page 26

WAS IT THE WRONG STOVE?
Or perhaps the wrong situation? The Lorena, an energy-saving cookstove, didn't catch on amongst the "displaced persons" of strife-torn El Salvador. By FRANCISCO JAVIER SANDOVAL. page 28

A VISIT TO CENEEMA
JACQUES DANOIS describes how at least one part of resource-rich Africa is marrying its own strength and imagination with outside interventions. page 29

FINDING THE MIDDLE THAT DISAPPEARED
A look at how the appropriate technology movement got started, and continues to dominate modern development thinking. By JOHN MADELEY. page 30

DEVELOPMENT EDUCATION
News from Switzerland and Japan on how people are learning about the developing world from small projects, some well-planned and some more spontaneous. page 33

UPDATE
News about UNICEF events. Report on prepration for the next Executive Board session and the new Board Chairman. page 34

ISSN 0379-2854

Technology: "Appropriate" for what and for whom?

In recent years, the improvement of traditional technologies, rather than their replacement by expensive imported alternatives, has become widely accepted as the most "appropriate" way to respond to people's need for technological advance. For UNICEF, appropriate technology can be harnessed to basic services. It can be used to overcome the special energy crisis affecting women in poor societies: the sapping of all their time and strength by overwhelming domestic and agricultural burdens. JOHN BALCOMB looks at the connection between appropriate technology and improved family life.

In former days, so the story goes, the kings of Thailand exercised a subtle method of punishment. An unruly subject would be graced with the gift of a royal white elephant. The costs of care, feed, stables, and stately maintenance would quickly bankrupt him. Expensive, sophisticated, high-technology imports which run up a country's foreign debt by their appetite for imported fuel and expensive maintenance, are white elephants of a similar variety.

There was a time, when wholesale modernization was seen as the answer to development. The whole technical assistance movement was initially based on the idea of transferring modern technology from the rich countries to the poor. A great deal of this modern technology *has* been transferred – from carbonated soft drinks to gigantic hydroelectric schemes. But the results in terms of improving living standards for the great majority have been spotty to say the least. As one third world commentator puts it: "It's easy for a developing country to go from the ox-cart to the jet age. But in the process it leaves 90 per cent of its people behind."

The "green revolution" has benefited mostly the bigger farmers, those who can afford the irrigation and fertilizers that the new high-yielding strains of cereals require. The hydroelectric power has gone to spanking new industrial plants, while villages remain unlit and millions of acres of productive land are drowned. Show-place hospitals in the cities add open-heart surgery to their repertoire, while poliomyelitis, preventable by an oral vaccine, continues to disable children.

"Appropriate technology" means a technology that is appropriate to a certain situation and need. As Karl Eric Knutsson, UNICEF's Regional Director for Eastern Africa, has observed, the term can cover a multitude of things. "A nuclear weapon is certainly appropriate if the objective is maximum destruction of human and material resources." In today's development jargon, however, it has come to mean something specific: a low-cost technology, using mainly local or easily obtainable materials and skills, which meets a recognized need and fits in closely with local attitudes and aspirations.

The United Nations agencies began to take an active interest in appropriate technology in the 1970s. By this time, partly as a response to the ideas of E. F. Schumacher and his Intermediate Technology Development Group (see page 30), small-scale "humanizing" technologies which applied traditional skills to traditional materials had become fashionable in certain development circles. Instead of pursuing their instant replacement, certain appropriate technology pioneers began to extol their virtues as a useful complement to alternatives from the industrialized world.

A playground for gadget-happy cranks

At first, appropriate technology often looked like a playground for gadget-happy cranks, with an outlook influenced by the western "back to the land and the simple lifestyle" movement. Some of the products promoted in the name of "appropriate technology" – windmills based on 19th century designs, carts whose manufacture depended on the availability of old Landrover chassis, harrows made out of branches from the trees – not surprisingly gave the whole idea a bad name. A classic example of the "inappropriate" was the bicycle grinding-mill introduced into a rural African community, in glorious oblivion to local custom which decreed that only women ground flour, and only men rode bicycles.

Many developing nations understandably regarded appropriate technology as a condescending gesture of the rich toward the poor. Their notion of development was not commensurate with ideas that seemed to have been dreamt up on their behalf, particularly when such ideas derived from disaffection with the industrialized, consumer society they were now trying to join.

Attitudes have changed in recent years as the application of the concept in a properly scientific manner has proved that "appropriate" means just that, and is no mask for "second-rate" or "inferior." Events have also served to push the concept of appropriate technology into the limelight. Hit by a ten-fold increase in oil prices and soaring foreign debts, more developing countries are looking for ways to improve their traditional technologies. So long as imported energy was cheap, with petroleum at $3

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Women, often ignored by economists and planners, are frequently amongst the last to receive the benefits of technical innovation. ICEF 6324/Liftin

a barrel, appropriate technology sounded like a romantic, rather than a realistic or necessary, option. People had survived with their own ways of doing things for millenia, and presumably they could wait a little for the benefits of western technology, based on cheap energy, to reach them. The energy crisis has changed perceptions radically.

Most advocates of appropriate technology in the developing world are principally concerned with the introduction of new techniques in agricultural or industrial production. Their goal is economic: they look to an improvement in living standards through the establishment of small-scale enterprises; a gradual process of technological innovation sustainable within the existing capacities of poor communities; a process of industrialization which avoids the de-humanizing pitfalls of earlier experiences in the West; and the sound exploitation of local resources and skills, particularly in view of the growing problem of widespread unemployment.

However laudable, these are not UNICEF's immediate concerns, which as always are to do specifically with the welfare of women and children. UNICEF's involvement with appropriate technology is exclusively geared to its social dimensions – ways in which the concept and spirit can be harnessed to the improvement of family living. The notion of "appropriateness" can be applied as much to health care and education services as it can to setting up rural workshops for the manufacture of farming tools. In particular, as an article from Africa in this issue of **UNICEF news** explores (see page 7), UNICEF has found many opportunities for promoting appropriate technology as a means of lightening women's heavy domestic and agricultural burden.

Women's personal energy crisis

Women, whose roles are so often ignored by the economists and planners, are often among the last people to receive the benefits of the latest in development thinking. Perhaps it is not surprising that many of the respects in which traditional technology lags, and where the possibilities of simple improvements are the most obvious, have to do with tasks performed by women. It is as if the drudgery of women themselves was the most commonly accepted form of appropriate technology.

In virtually all developing countries, women's "domestic tasks" include two very

continued on page 6

UNICEF and household fuels

Perhaps the most arduous burden Third World women bear, sometimes with the help of children, is the gathering of firewood. To this physical burden has been added in recent years the more threatening element of scarcity: the world's supply of firewood is being used up more rapidly than it's being replenished. The Food and Agriculture Organization estimates that by the end of this century, close to three billion people will be living in areas of acute fuelwood deficiency. As Erik Eckholm warns in a new publication, UNICEF *and the Household Fuels Crisis*,* what is at present a developing crisis could speedily turn into a major catastrophe because close to half of humanity depends upon firewood (or charcoal derived from it) to meet essential survival needs such as cooking and warmth.

Firewood's diminishing availability can also have an impact on health and nutrition. Dung and crop residues are being diverted from fields to fireplaces, at the expense of reduced food production. Soaring wood and charcoal prices have meant that many poorer urban families in some countries are using between a fifth and a third of their income for fuel alone, diverting yet again the resources they have available for food purchases. In addition, nutritious foods such as soybeans which require long cooking are not finding favour, and less frequent boiling of water and heating of shelters are also contributing to ill health amongst the poor.

Scarcity might be the frightening part of the picture, but the other, the amount of labour that goes towards the acquisition of fuelwood, is of equal concern to UNICEF. Eckholm's book reports studies which have documented the extraordinary amount of time taken up by the search for fuel. In parts of Tanzania, for example, as many as 250-300 person-days are devoted by households to wood collection. Villages in one zone in Nepal spend 11 days a month gathering wood, with one family member (generally a child) assigned full-time to the task. In northern Ghana one full day is required

**Published by, and available from, UNICEF offices in New York and Geneva.*

to gather three days' supply. In parts of Niger, journeys of more than 25 kilometres, which take a full day and seriously disrupt life, are common. In Gujarat, India, a family member must spend three hours a day gathering wood—all harrowing reminders of the crushing poverty and rudimentary technology prevailing in much of the developing world.

The household fuels crisis is closely related to UNICEF's traditional concerns with family income, nutrition, and health. Since women are the primary gatherers of fuel for domestic purposes in most parts of the developing world, and as this task is becoming progressively more onerous and time-consuming, the time and energy they have for other domestic tasks, particularly those related to the care of their children, is under growing pressure. For this reason, as these pages explore, UNICEF has become increasingly involved in promoting energy-saving stoves and alternative energy sources. Amongst the latter is biogas.

Biogas is a particularly useful source of power because in addition to providing the methane that can be used for cooking, lighting and even the running of engines, its slurry and sludge are excellent soil conditioners. Interest in biogas crystallized during the 1970s, when oil prices shot up and fuelwood scarcity began to cause concern. Four countries—China, India, South Korea and Taiwan—constructed large numbers of units (China now has almost eight million), and over 40 others set up experimental or pilot projects.

Most biogas units around the world belong to individual families, and examples of successful communal plants are few and far between. The communal plant is, however, considered more desirable since its benefits are more equitably distributed. Individual biogas units can sometimes aggravate existing inequalities, as for example in India where the poor lose access to free dung once the wealthier farmers turn to biogas production. Feasibility studies of such plants should therefore be concerned with more than merely technical considerations.

Eckholm's book discusses at length tree planting and reforestation to replenish and enlarge fuelwood stocks through the establishment of village or community woodlots. Community participation is again crucial here because many new woodlots have suffered from incursions by people and livestock seeking to fulfill immediate needs. Equally important is the need to create multi-purpose woodlots which provide fruits, fodder and other products, as these compensate for the curtailment of certain agricultural activities necessitated by setting aside land for woodgrowing.

Whatever form activities in rural energy-saving and replenishment take, a vital element is women's participation. As the main gatherers and users of fuelwood, their knowledge of it is often superior to men's. The fact that few women are found on the councils or bodies dealing with the issue might account in part for the slow progress being made to deal with this crisis. (S.L.)

FAO estimates that close to 3 billion people will be living in areas of acute fuelwood deficiency by the end of the century. Photo: Earthscan/Edwards

continued from page 4

time- and energy-consuming duties: the gathering of fuel for heating, lighting, and cooking; and the collection of water for all washing, drinking, and cooking purposes. While the "energy crisis" in the industrialized world is seen almost exclusively as an "oil crisis," in the developing world the daily fuel crisis faced by most women is the dwindling supply, and the rising price, of the firewood they use for all their household needs. (See inset box.)

The other energy crisis women face is the constant sapping of their own time and strength in walking ever further distances in search of both these essential survival requirements – fuel and water – and in the back-breaking toil of carrying heavy loads on head or back home from the woods or the stream. Their only helpers are their children, who join in this daily quest as soon as they are strong enough to carry a few twigs or a small cup of water. Only – perversely enough – when mechanical aids are introduced, (bicycles for porterage, for example) do men start to join in these tasks. Or, of course, where there are opportunities for trade, for selling firewood by the bundle, or water by the litre.

The kind of devices UNICEF promotes

One approach to the conservation of firewood which offers an immediate return is the use of more fuel-efficient cooking stoves. In many parts of the world, the rudimentary nature of domestic cooking arrangements is remarkable. In Ethiopia, for example, there is a high level of traditional technology in agriculture and in crafts. Yet, as in most of Africa, the three-stone open fire is still the most common way of cooking. An enclosed two-pot clay stove, with a flue vented to the outside, is now being introduced with UNICEF assistance. Fuel savings run up to 65 percent.

In Kenya, the three-stone fire is also still common. But wood scarcity and urban living have encouraged the use of a portable charcoal-burning brazier called a *jiko*. The walls of the *jiko* are made of thin sheet metal, and most of the heat is lost through radiation. UNICEF is now assisting local artisans to manufacture and market improved *jikos* with clay insulation built into the walls.

In India, fuel shortages have led to widespread use of cattle dung, usually the only available fertilizer, as fuel. By putting the dung in an air-tight digestor equipped with plastic piping and valves, a small biogas unit can be devised, producing cooking gas and leaving a valuable residue for fertilizer. In the current five-year period, India is offering subsidies to encourage the construction of a million biogas plants.

Where water collection is concerned, a considerable benefit to women is derived from bringing the water supply closer to home. One of the most successful appropriate technology accomplishments of recent years, both by economic and social yardsticks, has been the development of efficient, cheap and sturdy handpumps such as the India Mark II. Being able to raise water easily from a depth, as well as being able to trust its purity, are "appropriate" gains for women and children.

Where water storage is concerned, locally-made cement water jars, with the cement poured over a mould or plastered over a traditional wickerwork basket, have caught on widely in East Africa. They are normally used to store water caught from the roof. The idea came originally from Thailand, and when it was introduced in Kenya, it quickly became a "best-seller" in terms of replication.

There are many useful innovations for reducing the work required to store and process foodstuffs. Models have been developed in many countries of small rat-proof granaries, constructed from local materials. But simple solar drier, made from clay, bamboo and polythene sheeting, introduced in Kenya at the same time as the cement water jar, did not catch on. People simply did not appear to want it. This illustrates a very obvious point: in any process of innovation, the intended users have to be consulted at every step. Trying to foist bright ideas on people without consulting them and without understanding their reasons for doing things in their existing way is unproductive.

The "Song of Ocol" by Okot p'Bitek sums up the way in which woman's labour is perceived in Africa:

Woman of Africa
Sweeper
Smearing floors and walls
with cow dung and
black soil,
Cook, ayah, the baby on
your back,
Washer of dishes,
Planting, weeding,
harvesting,
Store-keeper, builder,
Runner of errands,
Cart, lorry, donkey...
Woman of Africa
What are you not?

An effective example of appropriate technology is ORS, which could save most of the children who die annually of diarrhoea. ICEF 9300/ Mangunwidjojo

Appropriate technology, so far as UNICEF's involvement goes, is part of UNICEF's general basic services approach, which sees improvement in the condition of children in low-income communities as being heavily dependent on the involvement and participation of the communities themselves.

"Appropriate" is not regressive

Emphasis on traditional skills and local capabilities does not mean that appropriate technology should be regressive. Many advances in science and technology are appropriate at any level: the appropriate way to protect a child against measles is to immunize against it. Oral rehydration therapy for diarrhoea, which can be carried out by mothers themselves using a prescribed solution of salt and suger in boiled water, is an outstanding example of appropriate

technology. Some appropriate technology devices use cheap materials based on sophisticated organic chemistry in their manufacture: plastic tubing and polythene sheeting, for example.

In looking for affordable technologies to improve village life, the developing countries can probably learn more from each other than they learn from the industrialized countries. In UN jargon this is called TCDC, which stands for "Technical Co-operation among Developing Countries." Throughout the mountainous region extending from Nepal to Turkey, simple run-of-the-stream water mills have been used to grind grain since earliest times. An "improved water mill" is being developed in Nepal, but even an unimproved Nepali water mill would be a useful innovation in many parts of the developing world where the energy of small, rapidly flowing streams goes to waste.

The crux of appropriate technology – as of basic services in general – is to further people's own efforts in building a better life at community level. Appropriate technology is not foisting off a second-rate technology on the poor of the world. It will – or it should – help them meet their basic needs in ways that do not leave them in eternal vassalage to imported goods and services from the industrialized world. □

The thud of a thousand hoes

Women in Africa spend up to 16 hours a day on manual labour. New tools and machinery would ease their load. But it is invariably the men who gain from mechanization. Women need the benefit to technical innovation, not only to reduce their domestic load, but to help them solve ever more pressing economic burdens.

By LINDSEY HILSUM.

The earth vibrates with the thud of a thousand hoes: all over Africa women are planting, weeding and harvesting their families' food. The air is alive with the sounds of threshing, winnowing, pounding and grinding, as women process the foodgrains they have reaped. From forest and riverside the wind carries women's voices, as they collect firewood and water to carry home on their heads and backs.

In Africa, where a rural woman's day can consist of up to 16 hours of manual labour, introducing new tools and machinery can make women's work less arduous, contribute to increased food production, improve homes and health, and provide women with a means of earning income through cottage industries.

Saving labour is the primary advantage of most technological innovation. Yet, although it is the women who are most overworked, labour-saving technology in rural Africa is mostly owned, operated and maintained by men.

Often the agricultural equipment introduced is fairly advanced: the tractor is the classic example. Marilyn Carr, in her book *Appropriate Technology for African Women*, writes: "When such equipment is introduced, the men (attracted by the novelty of the machinery and the promise of more money with a minimum of effort) usually take over the task of land preparation from the women. One wonders, however, if any thought at all was given to who would weed and harvest the extra acreages of land and thresh and winnow the extra yields."

Marilyn Carr goes on: "Even African women have only one pair of hands and only 24 hours in their day," and suggests that introducing simple weeders and methods of improved harvesting should be considered in all agricultural modernization schemes.

The practice of making men the focus of modernization has roots in the mythology that machines are a male preserve. In parts of Africa where hand-tools are still the main agricultural implements, women are still largely responsible for food cultivation. However, in Ethiopia, where a "machine," the ox-drawn plough, has been used for generations, it is the men who do most work on the land.

This does not mean that "men's work" and "women's work" are defined identically throughout the continent. In house building, the sexes have different roles in different places. In Somalia, the women build the entire house. In Tanzania, it is usually men who build the initial structure and women who pack it with clay or mud. And in many countries the traditional division of labour is breaking down as increasing numbers of men migrate to the cities in search of paid work, leaving women and children in the countryside to grow the family's food and fend for themselves.

The decline in food production

Marilyn Carr points out that with many men absent, women are having to take on tasks originally performed by men, as well

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UNICEF's involvement with appropriate technology is geared to its potential for lightening women's heavy domestic and agricultural burdens. ICEF 6485/Wolff

as continuing their own work. She sees this as an important cause of the decrease in food production throughout the continent.

One way food production can be increased, and women's toil on the land reduced, is to improve hand-tools. The hoe is one of the most versatile implements in existence and African women tend to use it for nearly all agricultural tasks. But if the handle is very short, or the blade badly-angled, they have to bend over and expend unnecessary energy over long, backbreaking periods. Improving the hoe's design and quality would make the work easier and quicker.

If trained in blacksmithing, woodwork and welding – men's virtually exclusive preserves – African women could make better tools for themselves. As the chief beneficiaries, they would be uniquely positioned to test out new designs and modifications. Women would also be able to start their own production units, and therefore earn some badly-needed extra income. But it is hard to picture the men according their approval.

In home and health

Another area where appropriate technology can help is in home and health improvements. Although a disproportionate emphasis is sometimes placed on women's domestic and mothering role, it is important to lighten the domestic workload.

First on the agenda, according to many African women, is reducing the many hours spent collecting water. A hand-dug well nearby is a great time-saver. Fitted with a small pump it may also improve health, since the water is cleaner than that taken from a river or water-hole. A water jar to collect rain-water from the guttering around a tin roof has been introduced in Kenya and other countries. It can also store water brought from the river during the dry season.

Throughout Africa the cutting down of natural forests for firewood, cooking and building is causing deforestation, desertification and soil erosion. African women experience the problem daily, as they have to walk greater distances to collect fuelwood from ever-receding forests.

Fuel-efficient clay stoves are being introduced in the province of Bale, Ethiopia. Although most women interviewed about the stove agreed that it has many advantages over the traditional three-stone fire – it saves fuel, prevents burns, prevents ash from spreading, so keeping the house clean – they were reluctant to make the leap from passive approval to building their own stoves.

The reluctance was not financial: the stoves are made purely of clay and require no purchased parts. The reason for the hesitation was found in the problem the stove tries to solve. According to Reidulf Molvaer, an anthropologist working with UNICEF's Eastern Africa Regional Office: "Women don't have the surplus energy to make stoves."

Turning approval into action, mobilizing women to make a stove today which will save them a fuel-collection journey tomorrow, depends on the customs of local people. In Ethiopia, where people tend to avoid doing anything which will make them stand out from the crowd, the most effective way of starting a new trend has been to involve everyone in the community through local branches of the Peasants' Association or the Revolutionary Ethiopian Women's Association (REWA).

Elsewhere, innovation is best introduced by engaging people with a standing in the community, teachers or chiefs for example. In sanctioning a new idea, they can diffuse it by example. Within a country, ethnic and cultural diversity may require different approaches: in Kenya there are more than 60 different ethnic groups. What is acceptable to one may be rejected by the others for cultural reasons.

Mechanization, money and men

The processing of staple foods – sorghum, cassava, maize and millet – is usually women's work in Africa. However, when processing is mechanized, the men often take over. When mechanized corn-grinders

"It's easy for a developing country to go from the ox-cart to the jet age. But in the process it leaves 90 per cent of its people behind." ICEF 7470/Ling

were introduced in Kenya, the men were taught to operate them. Milling generates income: each person bringing grain to be ground pays a small fee. Often entrepreneurs – usually men – buy a mill and run it as a business. The poorest women (who are usually the most overworked) cannot afford to pay the charges levied.

In some villages women's groups have successfully managed mills, ploughing profits into women's and community projects. To do this, women's groups need access to credit, to training in management and accounting. Unless questions of how to introduce, maintain and manage a technological improvement are addressed, something which has the potential to reduce women's workload may remain beyond their reach.

Saving time is often cited as the major advantage of adopting a new technology. However, to African women, whose lives are not ruled by what time the bank closes or the shops open, saving time may not be a priority. Reidulf Molvaer points out that new techniques which save time on one chore can all too easily lead to more time being spent on others. Not surprisingly, women's attitudes to innovation can be ambivalent. An old man in a Kenyan village where a hydraulic ram pump is saving women several weary hours a day carrying water up a steep hill, reacted by saying: "The men here like the pump because now, when we tell our women to do something, they haven't got the excuse of saying that they have to go for water!"

Other people suggest that women would be best occupied in spending time saved on looking after their children: taking the baby to the clinic more often, or varying the family diet. However, with food production falling throughout the continent, improving children's health requires growing more food rather than taking on more domestic chores. Similarly, many African women find that they need more cash these days, and they prefer to use any extra time to start up small-scale business ventures to earn some money, rather than on spending more time around the house.

Are crochet or building blocks more "appropriate"?

Traditional crafts are often promoted as a way of generating income. Sometimes these handicrafts ventures have proved very lucrative – usually for the middlemen, not for the women, unfortunately. The main market for baskets, carpets, embroideries and weaving is the tourist trade, which is notoriously fickle. Consumer taste is subject to sudden changes of fashion in the industrialized countries which buy the handicrafts.

In Swaziland, women trained at the Entfonjeni Appropriate Technology Centre, have had some success with marketing garments, tablecloths, tie-and-dye and batik to tourists, but the market is irregular. Making school uniforms has also brought an income to some women, although it is difficult to sell at a good price, and remain competitive with cheap imports.

Ivy Mkhomta originally learnt crochet at Entfonjeni, but recently took a course in making building blocks. "There is a market for blocks," she explains. "We sell them to people in this area who are building houses or schools. There was no market for crochet." Ivy Mkhomta is a member of a co-operative, comprising one other woman and three men. They are making blocks with a soil ram produced at the Appropriate Technology Centre, and the staff of the Centre are providing technical support in accounting and management.

In neighbouring Mozambique, where household items such as cups and dishes are scarce, pottery is proving to be a viable trade. In one of the *bairros* (suburbs) of Maputo, 13 women from the local branch of the Mozambican Women's Organization have formed a pottery co-operative. They started off making clay letters and model animals as teaching aids for the Ministry of Education, and then decided to make their own cups and dishes as a sideline. Now they are discovering that they can sell them to other people in the *bairro*.

It is small-scale initiatives such as these which demonstrate the potential of appropriate technology to improve life in Africa. Through local initiatives to produce labour-saving devices, such as improved tools, stoves, water- and grain-storage units, and to create industries based on local requirements, women can take the lead in bettering the lives of their children and of the community as a whole. □

Appropriate technology: the needs

Energy

Consumption of Energy, per capita

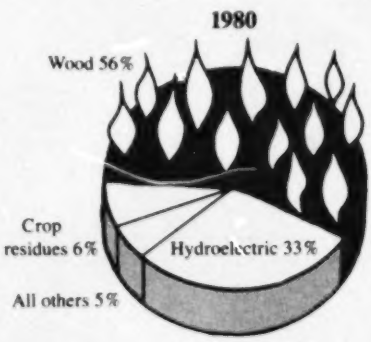
The developed countries use much more energy than the developing: North America's per capita consumption, for example, is more than seven times that of neighbouring Latin America. In addition, developed world usage is much more costly, since most of it is from non-renewable sources such as oil and gas.

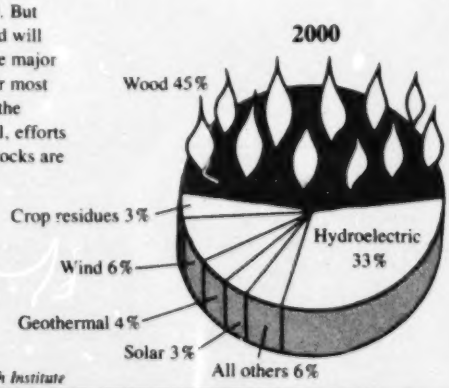
Region	Consumption (coal equivalent, kilos per capita)
Asia	550
Africa	275
Latin America	1,375
U.S., Canada	10,500
Western Europe	4,190
Eastern Europe	5,592
Japan	3,690

Source: Based on information from UN Yearbook of World Energy Statistics, 1980

Consumption of Renewable Energy Resources

Fuelwood is the most widely used of these, but it is not always easily obtained, and its stocks are being rapidly depleted. This has spurred the development of more readily available, less easily exhaustible energy sources such as wind and sun, each of whose consumption is expected to increase a hundred-fold by the year 2000. But because fuelwood will continue to be the major energy source for most rural families in the developing world, efforts to replenish its stocks are essential.





Source: Worldwatch Institute

World Consumption of Energy, Renewable and Non-Renewable, 1980-2000

Year	Coal	Petroleum	Natural Gas	Nuclear	Renewables	Total
	(million metric tons coal equivalent)					
1980	3,149	3,908	1,807	244	1,804	10,914
1990	4,660	3,712	1,900	645	2,404	13,321
2000	5,680	3,322	1,850	730	3,635	15,217

Source: Worldwatch Institute

Agriculture

Lowly Mechanized

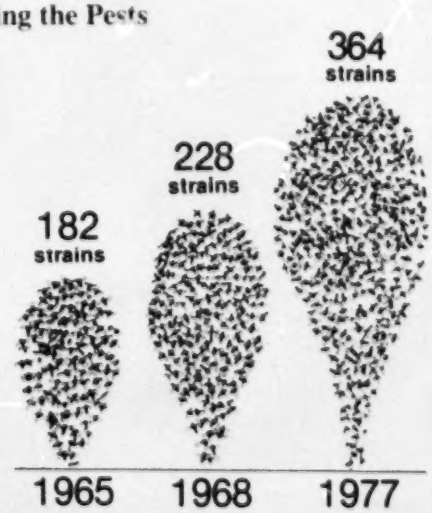
Johnson/FAO

Agriculture is the major human activity in the developing countries, consuming more time and effort than any other area of labour. Most agricultural tasks in the Third World, especially in Africa, are performed by women. As in other areas where women toil, agriculture remains lowly mechanized, which accounts in part for arable land lying fallow even in some food-deficient countries.

Green Revolution

An outstanding example of appropriate technology was the "Green Revolution" which came out of the development of high-yield grain seeds suitable for tropical agriculture. Its impact was limited mainly to Asia, where dramatic increases in food production were recorded; in Africa, food production per capita is actually on the decline.

Fighting the Pests



Recent gains in food production are being offset by the immunity certain pests are developing to commonly-used pesticides.

Food

Storage

The absence of secure storage to protect food after harvest results in losses of up to 20 per cent, and for more perishable foods up to 50 per cent, in the developing world. Food losses could be substantially reduced through improved storage and through the development of rural industry to process the food through canning or drying.

Defeyer FAO

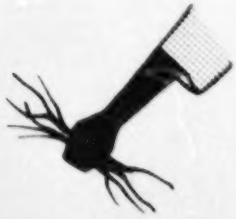
Grinding

Pounding and grinding are onerous, time-consuming labours for women in most countries. Small-scale mills, while out of reach of many individual families, built on a co-operative basis could reduce some of the drudgery involved in food preparation.

UNICEF 038/83/Senegal/Engel

Preparation

Cooking for the family is a heavy responsibility, which with the related labour of collecting water and firewood takes up to five hours of a woman's day.



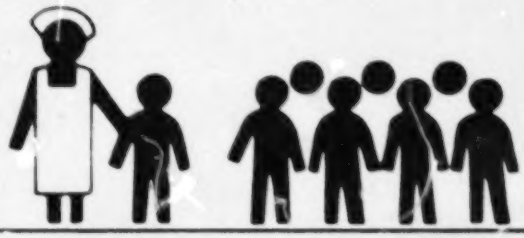
Health

Reaching the other 70 per cent

Region	Doctors per 10,000 population	Population per physician
E., W. & Central Africa	.65	15,500
S.E. Asia	1.5	6,646
S. Central Asia	2.5	4,021
East Asia	4.8	2,106
South America	10.7	1,128
Europe, N. America	17.5	572

Source: WHO Statistical Annual 1980

Only 30 per cent of the population of developing countries have access to conventional curative health services. The chance for most of them of being treated by a doctor is even more remote (see above). The delivery of health care by doctors and hospitals is prohibitively expensive, and often inappropriate for the kind of regular preventive attention needed by most mothers and children. Primary Health Care services, with their emphasis on community-based, low-cost health measures, offer the best hope of an improved standard of health for all.

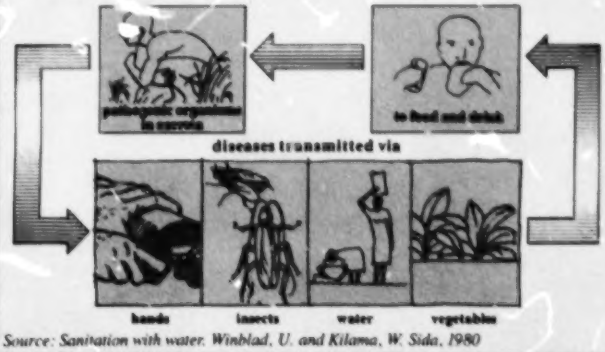


Simple, Inexpensive – and Effective

A simple, inexpensive and efficacious "technology" to counter the world's largest killer of children – diarrhoea – is oral rehydration solution. Its delivery is now possible through the spreading Primary Health Care networks and other forms of community organization.

Infection from Poor Water and Excreta

The vast majority of children's illnesses are water related. Development of simple inexpensive pit latrines and safe communal water supplies would strike a major blow against child morbidity and mortality



Source: Sanitation with water, Winblad, U. and Kilama, W. Sida, 1980

12

Somalia

An extraordinary experiment in the sun

Difficult problems demand innovative solutions. But innovation is risky. The villagers of Kudha needed fresh water, and an experimental solar still was constructed. But the risks turned out to be costly.

In the desert, deep in the south of Somalia, perched on the desolate rim of the coast, is the small village of Kudha. The people of Kudha survive in conditions of extreme hardship. Until 1974, Kudha did not exist as a village, only as a grazing area for the camel herds which the nomadic Somali drive from one pasture land to another, from season to season.

In 1974 the Somali government relocated 3,000 fishing families from an offshore island to this new settlement on the coast, so as to bring them into contact with the rest of their countrymen, and with services impossible to establish on their island home. There was one outstanding problem: Kudha had no fresh water supply of its own to meet the demands of its growing population. Radical life-saving action was necessary.

It was in these inauspicious surroundings that UNICEF and its partners in government and other organizations embarked upon an experiment: the constructon of a solar still which would use the sun's rays to turn brine – sea water – into fresh drinking water for the people of Kudha. By one of those ironies all too familiar in the development world, it is often the most trying and difficult circumstances that require the most imaginative and innovative responses. But innovation carries with it a high risk of failure – a risk infinitely compounded by the difficult circumstances the innovation is trying to overcome.

Failure, if UNICEF and its partners are honest enough to say so, is what ensued in the case of the solar still at Kudha. But in the course of the project's extraodrinary history, a number of valuable lessons were learned, particularly about what can happen when a project of a technical kind is not integrated into the social and economic framework in which it must work.

This article was prepared from a report written by Philip Hassrick, Programme Officer in charge of UNICEF's Technology Support Section in East Africa.

The solar still was by no means the first solution proposed to the problem of providing fresh water to the new residents of Kudha. The Somali Government had conducted a series of hydrological surveys in the area, and discovered that the nearest known sources of fresh water lay at 20 kilometres distance from Kudha. Convetional techniques for harvesting water – by surface catchment or by tapping a freshwater lens along the coast – proved impracticable and were abandoned. Finally, the Somali Government proposed a "last ditch" solution to the villagers' water problem: an experimental solar still for water production. As most of Somalia is parched semi-desert, this proposal had an added attraction: if successful, it could be replicated throughout the country.

The still's design: difficulties begin

A proposed design for the solar still was supplied from India. The design appeared to be relatively inexpensive and easily constructed. At this stage of the project's history, the technical input and supervision were the responsibility of another international agency, which later withdrew. UNICEF agreed to co-finance the project with the government.

The project on the ground began when two technical experts provided by the international agency arrived in Somalia to finalize the designs and supervise the still's construction. However, daunted by the difficult living conditions, they left the country two weeks later, with no indication of when or whether they intended to return. It became apparent in the weeks and months that followed that UNICEF and the Somali Government would have to provide not only the funds and materials to which they were already committed, but also the technical guidance in a complex experimental project, for which very little background information existed.

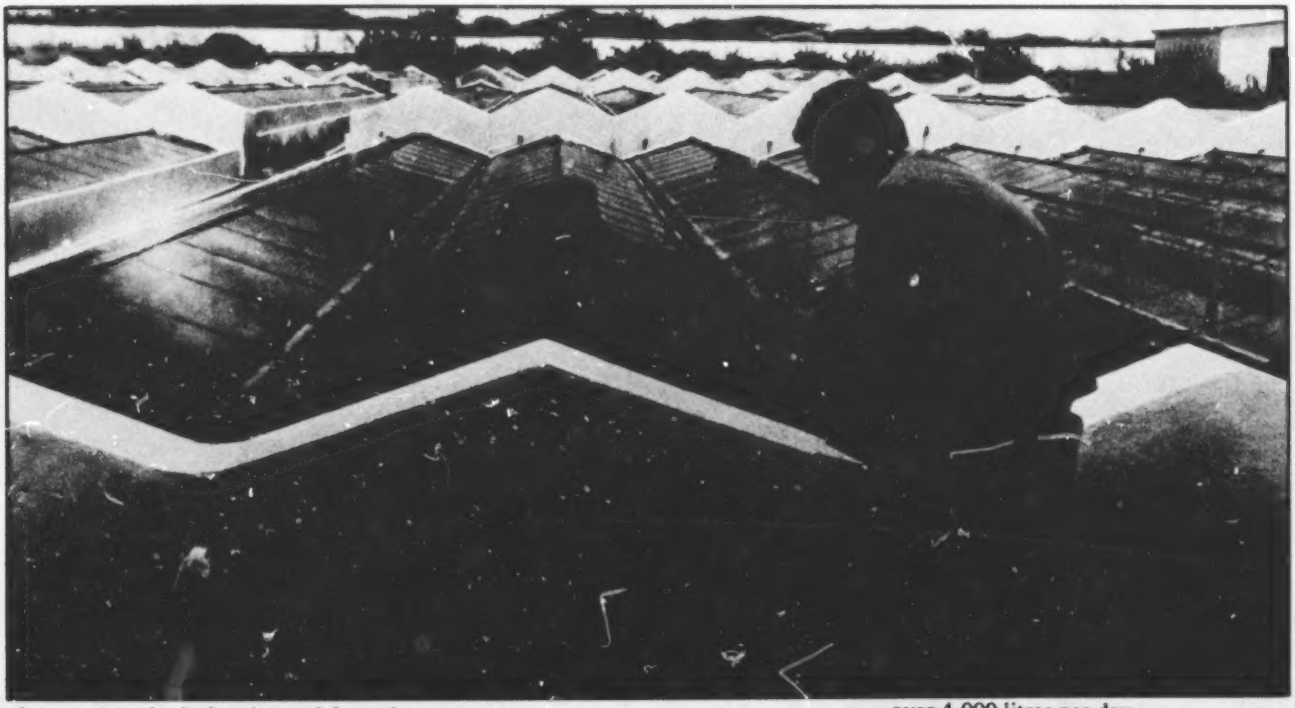
It is to the credit of the partners in this venture – UNICEF and the Somali Government – and the staff at Kudha who undertook construction of the still against tremendous difficulties, that they were able to carry out the project and complete it. Two kilometres from Kudha, near a fishing cooperative project assisted by FAO, a site was cleared and levelled. All the labour for the site preparation was done by hand, and provided voluntarily by the Kudha villagers.

Throughout the construction, the transportation of materials presented constant problems as the project vehicle broke down regularly in the rugged conditions.

Two buildings were completed, and one solar still basin. But delays resulted from changes in design, and a lack of technical supervision and material support. The project went ahead on a "learning by doing" basis, which turned out to be very expensive: delays led to high labour cost overruns, and in one instance an entire consignment of cement was lost because it hardened in the humid coastal climate.

Technical misunderstandings also led to the acceptance by UNICEF of a supply of glass from a low cost source for the glazing of the still. Glass of a three millimetre thickness was required to withstand the windy coastal conditions. But the glass purchased was only two millimetres thick. It broke easily and needed such frequent replacement that a new consignment off the correct thickness had to be ordered.

The need for a high degree of technical competence in a project of this experimental kind was constantly underscored throughout its history. As construction proceeded, the need for design modifications became apparent at almost every stage: brick was replaced with locally produced cement blocks; one water collection and holding tank was built where the original design specified two; the panel supports – originally designed in aluminum – were changed to concrete when the cost and difficulty of obtaining corrosion resistant aluminium appeared prohibitive. All these



changes were logical and sound from the design point of view; but they led to delays, and while the process may benefit a future project of this kind, the costs to this one were heavy. Six years after its commencement when the project was formally inaugurated, costs had escalated from an estimated US$75,000 to US$360,000.

The solar still can work

Following its completion, the Kudha solar still not only worked: it produced 400 litres of water per day over its estimated capacity. Since then, production has dropped to one-third, mainly because insufficient technical and financial commitments resulted in poor maintenance.

There is another problem. The number of project site staff has numbered as many as 53 staff and dependents. Kudha is not the easiest or most congenial place to live, and – of course – the supply of water is a major problem for anyone living in the area. The project staff use the still's water production output copiously, for their household needs.

The beneficiary community, under these circumstances, has had scant access to the water from the still. When they have received water, it has usually been during the rainy season, when the still's supplementary capacity for rainwater collection meant that water was abundant.

In 1983 the UNICEF Technology Support Section based in Nairobi carried out an evaluation of the Kudha still to determine its impact. On first sight, it might appear that the villagers in Kudha would view the extraordinary project in the sun with great scepticism, but that in fact is not the case.

The Kudha project demonstrated the necessity of integrating a technical innovation into its social and economic context: Photo: Hassrick

The first question must be: how have, and do, the villagers obtain their water supply, given that the still was supposed to be a "life-saving" action? In Somalia, where survival techniques in a harsh and hostile environment are part of the fabric of life, need quickly breeds resourcefulness. In spite of hydrological surveys whose results suggested an absence of water, the Kudha villagers soon discovered fresh water in layers under the sand in a new section of town.

Soon three communal wells were dug and protected and these became the sole source of water for both the village and for the project during the construction phase. Shortly thereafter, individual villagers began sinking private wells until "every other household had its own well." Finally, several weeks prior to UNICEF's evaluation, the FAO fisheries project intalled a US$5,000 wind pump on a shallow well to provide fresh water for their fish freezing operations. The wind pump, which only operated during the daytime, was able to produce over 4,000 litres per day.

Although the village has not been directly involved in the planning or running of the solar still, there remains a sort of innocent pride in the project which had led to a high – perhaps unrealistic – degree of optimism. The project is physically impressive to the villagers and although they are somewhat disillusioned, they do not doubt that in time water will be delivered. Some felt that individual household connections will be eventually provided and simply did not believe that the still's capacity was insufficient for this purpose. When it was pointed out that the still's entire production diluted with 25 per cent sea water would only provide little more than two litres per day per individual, most villagers felt that they had been badly misled. Nevertheless, they continue to support the project in principle.

What will happen to the Kudha solar still? It is questionable whether – given the costs of maintenance and the project's history – the Somali government will single-handedly want to back it to the necessary level beyond the period of UNICEF's engagement, which will shortly cease. This is an experiment where the costs of "learning" probably outstripped the value of "doing." That is a necessary part of the development process. The villagers of Kudha have so far found their own solutions. And other villagers, elsewhere, will no doubt profit from the experiment in the sun which tried, and failed. □

Bangladesh

A pump for all countries

Providing clean, safe water has become a problem even for Bangladesh, despite its abundance of rivers and monsoon storms. The safest water comes from under the ground, but dropping ground water levels are rendering obsolete the popular and inexpensively-manufactured shallow handpump. Help is on the way, however, in the form of the "Tara," a new, locally-refined pump whose low cost – a mere one-seventh of its current equivalent – will make widespread application possible. By SAYED KAMALUDDIN.

Bangladesh, written about in recent times more for its tragedies rather than its accomplishments, appears to be on the threshold of achieving a breakthrough in developing a low-cost, force-mode deepset handpump with enormous potential for meeting the drinking water needs of rural people.

Considerable progress in meeting these needs had already been made by government programmes – with UNICEF assistance – in the last 10 years through the sinking of shallow handpumps and tubewells. However, the success of the suction-mode shallow handpump development programme in ensuring the supply of safe drinking water seems to have been threatened by the gradual dropping of the ground water levels as a result of large scale extraction of ground water for irrigation purposes. The suction-mode handpump becomes inoperable the moment the ground water level drops below seven to eight metres.

The success of this new deepset handpump – called the "Tara" – is therefore timely, and is expected to save Bangladesh, and its donors, over $1.2 billion in production costs when compared with the cost of having to deploy country-wide the presently-used equivalent.

* * *

Between 70 percent and 98 per cent of rural households in Bangladesh use handpumps and tubewells as their primary source of drinking water, depending upon their location and the accessibility of other water sources. More than 70 per cent of the rural population now has access to handpumps within 700 feet from their place of residence, while about 40 per cent of them live within 400 feet of such a water source. But very few people use tubewells to meet all their water needs, mainly because of their relatively easy access to other sources of water, such as rivers, canals, ponds and open tanks.

The country now has a population well in excess of 90 million people – about 90 per cent of whom live in rural areas – and is growing at the rate of 2.4 per cent annually. Just to *maintain* the level of safe drinking water available, at least 25,000 new shallow handpumps need to be sunk annually on account of the population increase and the replacement needs of ageing pumps.

Bangladesh has one of the world's most extensive deltas, being the product of the two great sub-continental river systems, the Brahmaputra and the Ganges. A third of the delta goes underwater during the monsoon for about three months every year. Boats then become the only means of communication for the people to maintain contacts with their neighbours, for going to the market and for taking children to school. One can understand therefore how essential it is for people to have the handpumps as a source of safe water for drinking purposes.

Handpumps are not a new phenomenon in this part of the world. What is, however, new and has become essential for the country's fast growing population to meet their drinking water needs, is the government's UNICEF-assisted rural water supply programme launched soon after liberation. Under this programme, begun in May 1973, more than 350,000 shallow handpumps and tubewells have been sunk, bringing the total number in the public sector to more than 500,000. As a result, one handpump is now available for about 175 people, compared to about 400 in 1971. The programme aims at making available one tubewell for about 160 people by 1985 and for about 120 by 1990. To achieve this target, more than 50,000 new handpumps would have to be installed each year.

The suction-mode handpumps are sunk completely by hand, using the sludger method. The suction handpumps, known as Bangladesh New No. 6, were re-designed, marginally changing from the traditional pumps being used in the country, by outside consultants and further modified by UNICEF Bangladesh experts in keeping with local conditions. Its manufacture, transport, installation and maintenance need such minimal expense that it is now being imported by many developing nations, including Pakistan, Nepal, Burma, Vietnam and Papua New Guinea.

A simple one-day course

The maintenance of these handpumps substantially improved after the training of 190,000 tubewell caretakers in the rural areas in a three-year-long programme. The training is very simple, lasting for only one day. The caretaker is shown how to dismantle and reassemble the pump, explained the usage of its parts and is also given a pair of very simple tools with which to dismantle, inspect and carry out the necessary repair work. That takes half a day. The other half is devoted to elementary health education: the impact of the availability of safe water on the people's health in preventing illness.

The results of the training have been impressive. Surveys undertaken in 1975 and in 1983 show that the percentage of operable handpumps and tubewells increased from 75 to 90. Experts believe that with greater effort, this percentage can be increased to 95. A five point increase might appear insignificant, but in Bangladesh it can mean the supply of safe water for a few million additional people each day.

Another rising concern is the gradual depletion of the ground water levels due to

Sayed Kamaludin is the Bangladesh correspondent of the Far Eastern Economic Review, Hong Kong.

The success of this new deepset village handpump – called the "Tara" – is expected to save Bangladesh over $1.2 billion. Photo: Khan

large-scale extraction of ground water for irrigation. Ground water levels in such areas in the country (about 15 per cent) fall below seven metres, and make shallow handpumps inoperable. Force-mode pumps are needed to pump out ground water below such depth and there are only about 6,000 such pumps in operation because of the high cost involved – about $2,000 a piece, seven times more then conventional shallow handpumps. This problem is likely to be aggravated further in the near future as the government's policy is to increasingly use larger mechanized deep tubewells to bring agricultural land under irrigation to raise food production. This will gradually, but nevertheless substantially, reduce the ground water levels.

According to a UNICEF expert on water, environment and sanitation, K.R. Gibbs, the large scale extraction of ground water has caused dropping of ground water levels "surprisingly quickly" and "when a balance between extraction and recharge has been achieved, as much as 50 per cent of the country may require force-mode pumps." This, in other words, suggests that Bangladesh will have to replace, in the not too distant future, the suction-mode pumps by about 750,000 force-mode deepset pumps at a cost of around US$1.5 billion, plus a recurrent cost of $100 million for replacement units annually. The magnitude of the task can be visualized when one considers that the annual budget for the rural and sanitation programme is under $20 million!

In addition to the enormous costs involved for the imported variety of these deepset pumps now in use in Bangladesh, they are also posing complicated and expensive maintenance problems. Almost 50 per cent of these pumps have become inoperable because of lack of maintenance funds.

The search for an alternative, and a cheaper variety at that, complete with simple mechanism – both for operation and maintenance – has been on for quite some time. Considerable work in this respect has already been done by Tim Journey and others at the International Development and Research Centre (IDRC), Ottowa, the work in Malawi on the Mark V direct drive pump and Karl Jensen's efforts in Ethiopia. Thanks to this previous work, a new pump has now been evolved in Bangladesh through close co-operation between the World Bank, UNICEF Bangladesh and a remarkable development engineer, Mohammad Ikramullah, who runs the local Agricultural Workshop and Training School. It is called the "Tara" Pump, all its parts below ground are plastic and it has a "direct drive" operation – all of which minimizes maintenance. What's more, the pump can be used even by children without difficulty and has a capacity to pump up 50 litres of water a minute. It can be installed as quickly as the Bangladesh New No. 6, using the sludger method. Its routine maintenance can be done without any hand tools by the caretaker with the help of one unskilled assistant. All its parts, including Roboscreen-type pvc filters, are fabricated locally. Its cost? Unbelievably low: less than $300, a seventh of that of the imported variety.

The implications of the successful application of this new pump are electrifying. It would be a boon not only for Bangladesh but for all developing countries.

For Bangladesh, using this Tara Pump instead of deploying the equivalent imported model would mean a saving of more than $1.2 billion. In addition, there would be annual savings of nearly $85 million in annual replacement costs. And the Tara could lead to the possibility of providing safe water to virtually all the rural people of this country. The problems that the International Drinking Water Supply and Sanitation Decade had posed before the planners in Bangladesh, and which seemed unsurmountable, would not be so overwhelming.

By 1985, the final design of the Tara Pump will have been completed and experts involved in the project believe that up to 20,000 units could be produced annually, rising to about 70,000 units annually by 1990. □

Their rubbish is our prime material

Clay, bamboo, and scrap metal can all be fashioned into low-cost teaching aids. In Mozambique, an Education Materials Development Group is pioneering their design and use in the classroom. But persuading educators that they are truly appropriate, and not second-best, is the challenge. By LINDSEY HILSUM.

An abacus is made of a bamboo frame with clay beads. A globe is an upside-down water pot. A model of the solar system is made of papier-maché balls and wooden discs. Educational aids can be constructed of the simplest and most widely-available materials. Says Keith Warren, Consultant on Teaching Aids with UNICEF in Mozambique: "Although there are a hundred problems, there are a thousand opportunities."

Sadly, those opportunities are usually missed. Throughout Africa, Ministries of Education are importing sophisticated educational materials mass-produced in the industrialized world. These are often not only expensive, but also inappropriate. Introducing a new science textbook sponsored by UNICEF and UNESCO, one Malawian Ministry of Education official pointed out that understanding science means understanding your immediate environment: "Look around you," he said to teachers. "You will discover that there is all you need to be able to teach science."

To help teachers use the resources around them, UNICEF is sponsoring several projects to promote low-cost teaching aids. In Ethiopia, district centres are "laboratories." The centre's innovators field-test their teaching aids in local schools, and teachers come to the centres to learn how to make them. Among the most commonly used materials are clay, sticks, stones, bottle tops, dried lentils and cardboard. Even a used light-bulb is valuable: filled with water it can act as a lens in a makeshift slide projector.

In Mozambique, UNICEF Consultant Keith Warren is working with an Educational Materials Development Group within the Ministry of Education, which also includes an artist, a carpenter and a teacher.

A child successfully completes her bamboo model of a water pump, an important feature in Mozambican life. Photo: Warren

One of the first teaching aids the Group developed was a ruler made of bamboo. The ruler is an important teaching aid: "A straight line is probably the first step in the idea of 'precision', a necessary base concept in many subjects." The children do not know what "straight" means. The walls of the school, the posts that hold up the roof, are all crooked. Consequently, when told to draw a straight line, they do not succeed. And when they do it wrong, they do not know what they have done wrong.

Similarly, the other aids developed have very specific educational aims. Clay letters are ideal for teaching literacy. Having fun is one sure way of keeping children's attention, and spelling with little moveable letters is a game. Animals made of clay are also useful, as talking points: "The elephant is *behind* the lion," "the dog is *on* the desk."

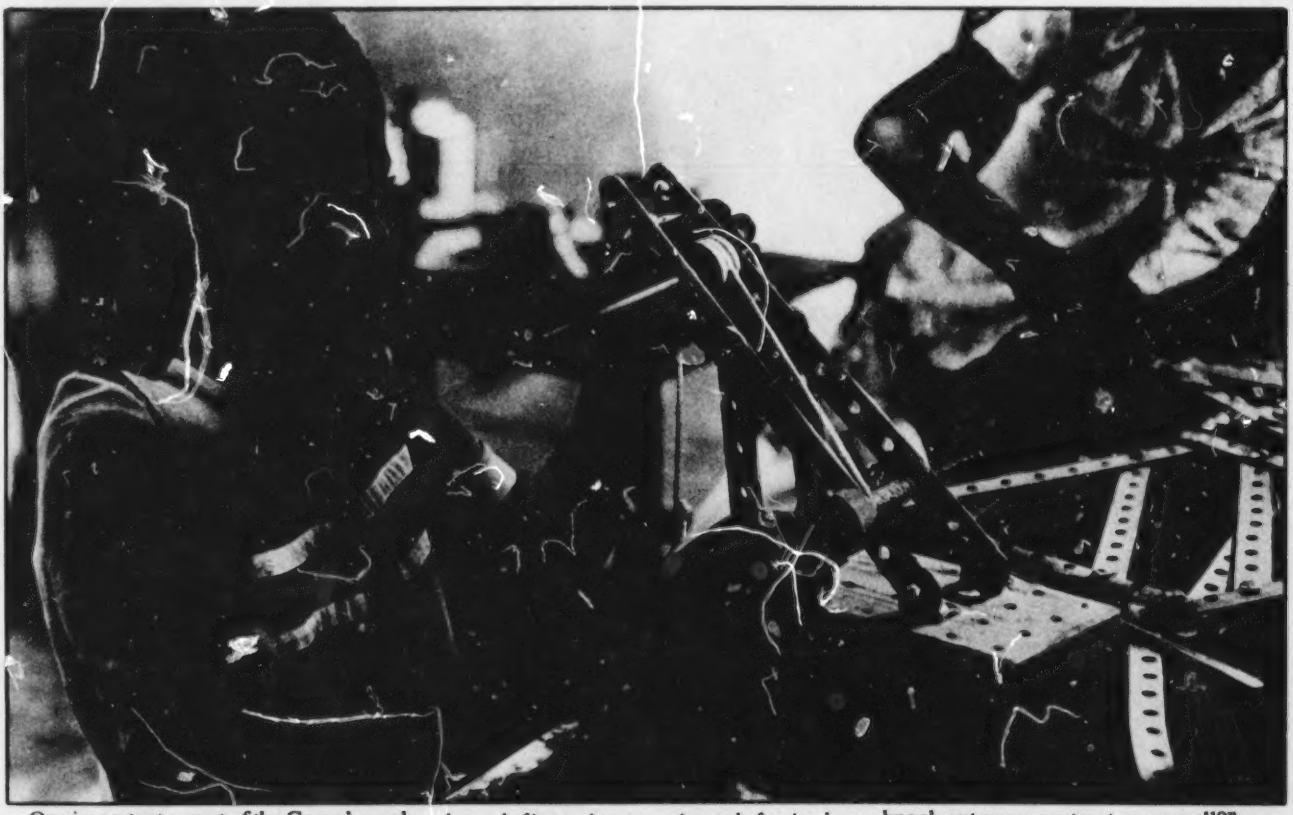
The bamboo water pump

More adventurous are model machines: a water pump made of bamboo, for example. The water pump is an important feature in the lives of Mozambican children, since fetching water is central to village life. Learning to understand how the pump works at an early age will increase the chances of maintaining the pumps presently being installed. Similarly, a model construction kit made of bamboo is cheap and immensely useful in teaching children how machines work, and getting them accustomed to a variety of practical tasks in construction and simple engineering. In the long-term this kind of education is geared towards self-sufficiency, both in human and material resources.

Field testing is important. Keith Warren thinks that schools used for testing the aids should be "typical." "The school should not have walls or a blackboard and paper, because most schools don't have them," he says. Mabamja School, where the team is presently working, is a single shed with a division of grass and sticks down the middle. The floor is earth, deep in dust. The school has walls made of leaves.

It is important to get the teachers involved: unless they accept the idea of "appropriate technology" teaching aids, few of the designs will find their way to the classroom. The main reason for selecting Mabamja School was that one teacher there had worked with the project team in another school, and was enthusiastic.

Lindsey Hilsum is Assistant Information Officer in UNICEF's Eastern Africa headquarters.



Instead of importing expensive and often irrelevant teaching aids, Mozambique's schools are making their own with local materials. Photo: Warren

One important aspect of the Group's work is training instructors of teachers in how to make low-cost teaching aids. Each instructor receives a set of simple tools, supplied by UNICEF, at a cost of about US$20 per set. Included are two knives, one sharpening stone, hacksaw blades, nails, files and pliers. Each of the 20 teacher instructors on the current course will introduce the making of low-cost teaching aids into teacher-training curricula next year.

Although teachers – and even the children themselves – can make some educational aids, production units are also required. In one *bairro* (suburb) of Maputo, women from a branch of the Mozambican Women's Organization have started a co-operative making clay letters and animals on commission for the Ministry of Education. The advantages of small units such as this one are that they are cheap to set up, and easy to manage. Keith Warren adds: "Small units assist the spread of technology amongst the people, who feel themselves part of the management and have to do many more tasks and understand more technologies than they would in a larger factory."

In Mozambique, the government is encouraging the establishment of just such small-scale enterprises, especially when they are part of the country's drive to save foreign exchange by manufacturing locally. Another initiative in line with the aim of saving foreign currency is using under-utilized capacity in factories.

Their rubbish is our prime material

At present, many factories in Mozambique are operating below capacity because of a shortage of raw materials. Instead of dismissing or suspending workers, factories are keen to find other work. They also have waste products: small sheets of metal, tubes, pieces of plywood. "To them, it's rubbish," says Keith Warren, "To us, it's prime material."

As an experiment the Educational Materials Development Group has been demonstrating some of the teaching aids in a bus-bodywork factory in Maputo. The workers have responded with enthusiasm and initiative. Soon after they first learned about the project, they made four hundred rulers from spare metal plates. "Now we've got this stamping press unused at present," said one worker, "Would you like us to knock out some protractors as well?"

The potential is almost unlimited. With foreign currency reserves low in nearly all African countries, women eager to set up small-scale industries, factories producing "waste" that can easily be turned into useful objects, and vast reserves of natural resources, the manufacturing of low-cost teaching aids might seem to have a bright future.

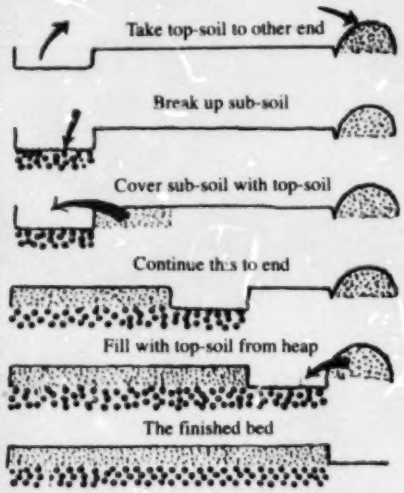
However, old prejudices persist. Often foreign experts are called in, and their frame of reference is not the materials at hand in Africa, but the prefabricated teaching aids used in other countries. Similarly, many people within Ministries of Education were schooled under colonial systems, where they learnt to despise things local and "home-made." In Africa there is an almost obsessive insistence on children wearing European-style school uniform, a symbol that education is still not seen as a way of mobilizing local skills, but of bringing African children nearer to the image of their European counterparts.

Designing the teaching aids is the easy part. Persuading the experts and the educators that such teaching aids are not second best, but the most appropriate, most useful tools to use in the classroom, is a much more difficult challenge. □

New tricks

The agricultural and domestic labou
also act as a brake on developmeat b
could be spent in more productive e
invested in the search for small-scale
the tedium of age-old tasks. UNICEF
to the production, storage, processin
have been tasks historically perform
bearing on family nutrition and healt
tracing the food cycle from planting
more promising improvements.

1. Technologies for improved yields

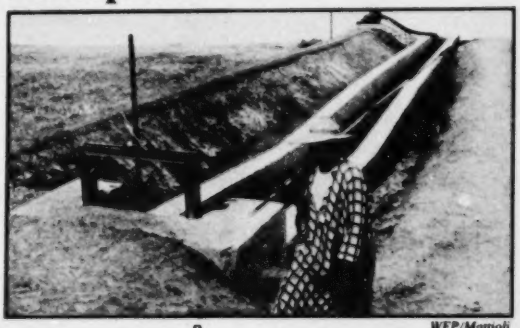

Take top-soil to other end
Break up sub-soil
Cover sub-soil with top-soil
Continue this to end
Fill with top-soil from heap
The finished bed

Improved seeds (as in the Green Revolution), home gardens (where families with small patches of land can grow their own food, even in urban areas),

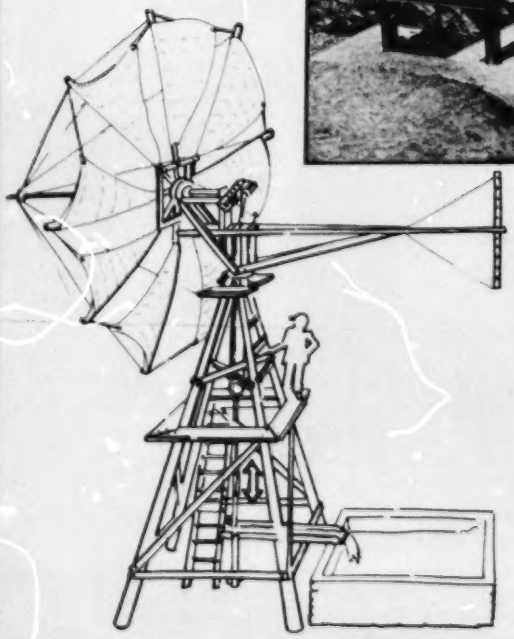
ICEF 7930/Wolff

and farming methods which better preserve and enrich the soil are amongst the means by which nations are hoping to prove that "every country in the world has the capacity to feed itself," in the words of *Food First* authors Francis Moore Lappe and Joseph Collins. **Left:** an intensive method of organic horticulture which enriches the soil to double or triple vegetable output. Closely-planted beds provide a mini-climate and a living mulch under the leaves which reduce weed growth and help hold moisture in the soil. *Source: Appropriate Technology Sourcebook*

2. Water power, wind power



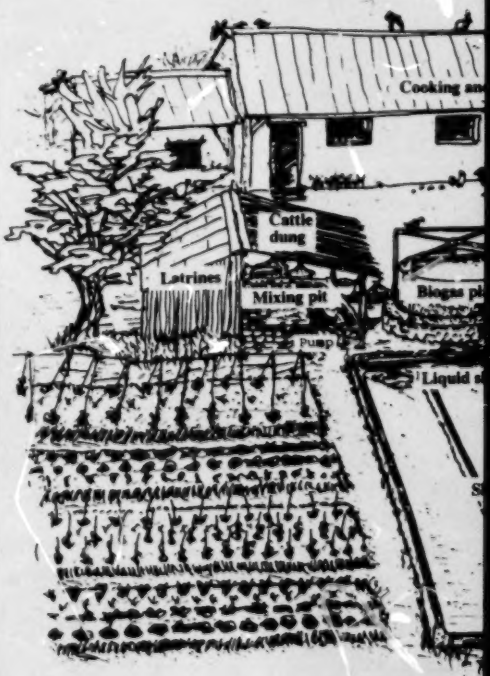
WFP/Mamoli



Irrigation is the biggest single factor in improving farm yields, especially in semi-arid regions. For energy-deficient areas, windmills provide one way to pump water. **Left:** an improved version of the Cretan windmill (which has been in use for centuries), a popular model because it can be made with mostly local materials and does not need prevailing winds.

Source: Appropriate Technology Sourcebook

3. Biogas and appropriate f

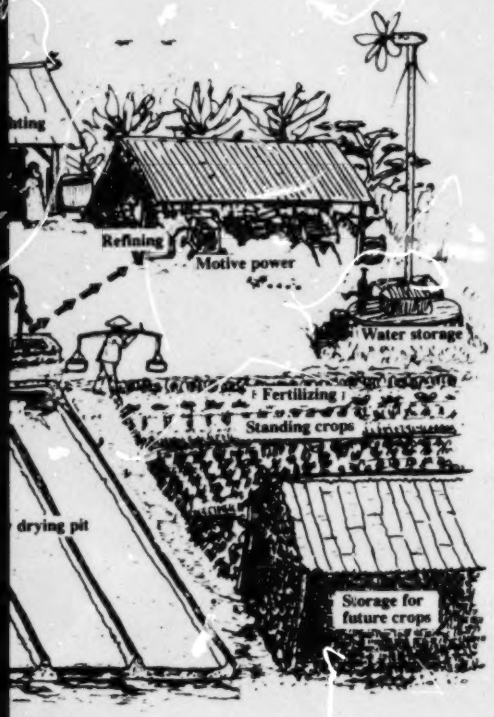


Biogas is an effective household fuel but the bio
satisfying a whole range of community needs. Th
from the waste which pose a health hazard to hu
and sludge by-products are excellent soil conditi
original waste. The slurry can also be used to fe
component of animal feeds. Construction of the
resources are available in most rural areas. Biog
fuel to reinvigorate village crafts and industries
cheap source of energy.

or old tasks

that so confine and burden women consuming time and energy that avours. Effort is therefore being appropriate" technologies to replace keenly interested in devices related nd cooking of food, since these by women and have the most direct This four-page picture spread, consumption, looks at some of the

rming



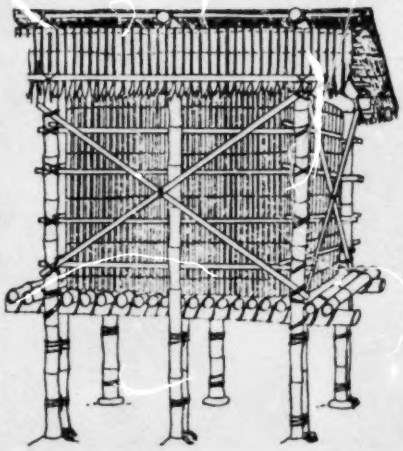
plant can additionally serve as the nucleus for enefits for health are obvious: the pathogens s are destroyed during "digestion"; and the slurry rs which preserve virtually all the nutrients in the ze fish ponds, and the sludge can be used as a t is labour-intensive, and the necessary skills and hould be able theoretically to produce sufficient ently stagnating, partly through lack of a reliable,

Source: A Handbook on Appropriate Technology (Canadian Hunger Foundation).

4. Food Storage

ICEF 7379/Thorning

Since more than a quarter of all stored grain in the developing countries is lost to pests and moulds, more secure storage would mean less hunger. Fortunately, improved grain storage at village level is technically straightforward. The critical part of the storage process is drying, since both insects and moulds thrive on moisture.



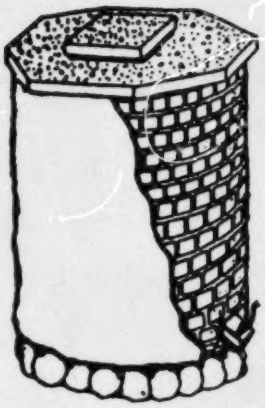


Illustration by George Clark/VITA

The crib and the silo

The traditional maize crib is easy to construct, and needs minor modification. Its position off the ground helps keep out rodents, insects and moisture, and allows free circulation of air. The improved mud-block silo has the advantage of being air-tight, and its emptying chute allows access to the grain without unsealing the top of the bin. It requires regular painting or whitewashing to keep out moisture and water.

Source: Peace Corps

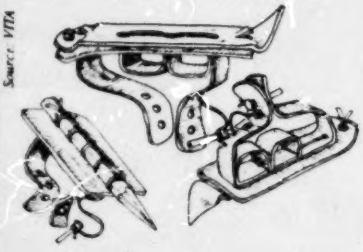
20

New tricks for old tasks *(continued)*

5. Food processing

Small improved tools which are still labour-intensive and can be easily manufactured by village craftsmen have found wide acceptance among small-scale farmers in developing countries. Shown here are four examples which have speeded up the processing of the major crops.

Source: VITA



Husking pegs

Above are three different kinds of corn husking pegs which are strapped to the finger or palm and rip the husk loose with one swift motion.

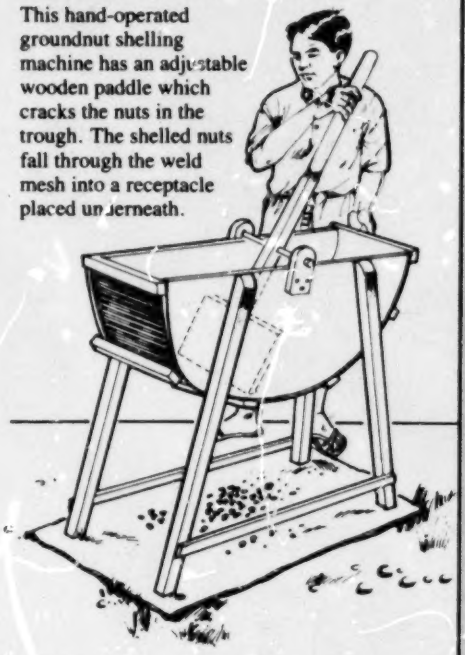
Maize sheller

This wooden, hand-held maize sheller uses the ridges to pull out the grain from the cob.

Groundnut sheller

Source: *Village-level Technology*, Bangkok (UNICEF)

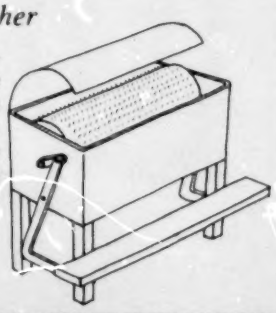
This hand-operated groundnut shelling machine has an adjustable wooden paddle which cracks the nuts in the trough. The shelled nuts fall through the weld mesh into a receptacle placed underneath.



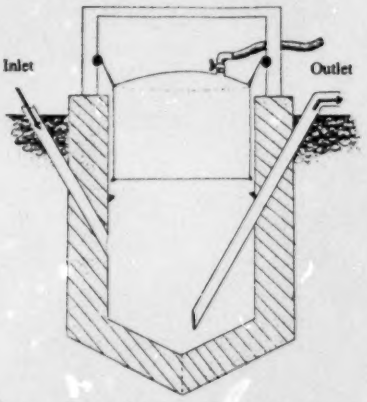
Rice Thresher

Source: *Village Technology in Indonesia* (UNICEF)

In this pedal-powered rice thresher made from a VITA design, wire loops pull the kernels of rice from the stalk.

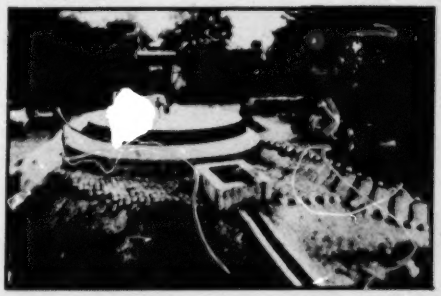


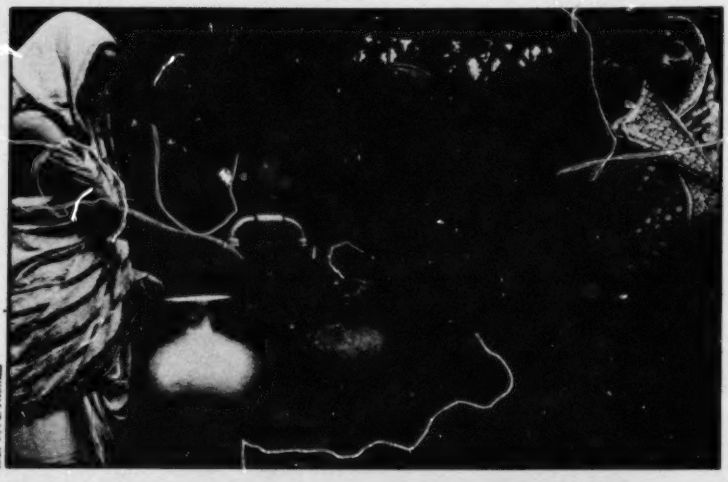
7. Household Fuels



Source: *Renewable Energy Dictionary* (VITA)

Biogas plants (pictured here is an Indian one and its methane-producing digester) are one answer to the world's dwindling wood supplies, which half of humanity uses as fuel for cooking and warmth. Other measures to counter firewood scarcity include improved cookstoves and solar energy, compacted fuels from charcoal dust and agricultural wastes, hot-box and hay-box cookers and community reafforestation and village woodlots.





ICEF 9176/Thomas

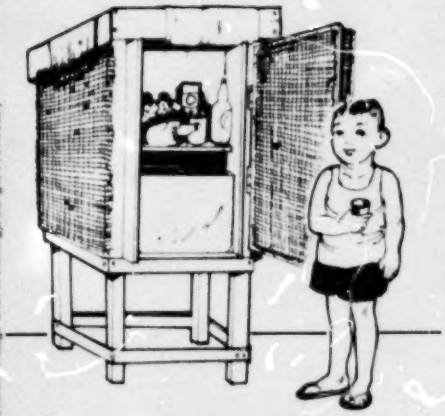
6. Water

Dirty water remains the greatest scourge of humanity, contributing to most of the illnesses which afflict and kill young children. Only a small fraction of the third world's population has access to clean water, the rest obtaining their needs generally from ponds, rivers and lakes often contaminated by refuse and pollutants. Pumps, with their ability to tap under-ground—and therefore clean—water sources are oneobvious answer promoted by the practitioners ofappropriate technology, but no easy solution exists to their high rate of breakdown (attributed in the main to lack of full community involvement in their use and maintenance).

Villagers without clean water can create their own small scale "water purification" system (**right**) in a simple clay pot containing graded layers of stones, gravel, sand and broken charcoal.

Source: *Village-level Technology, Bangkok* (UNICEF)

8. Preserving food



Source: Village-level Technology, Bangkok (UNICEF)

One way to preserve meats, vegetables and other foods is to either dry them or keep them cool. The simple charcoal cooler (above) uses water dripping down from the galvanised iron tray via heavy cloth strips ("wicks") onto side frames consisting of broken charcoal sandwiched between chicken wire mesh.

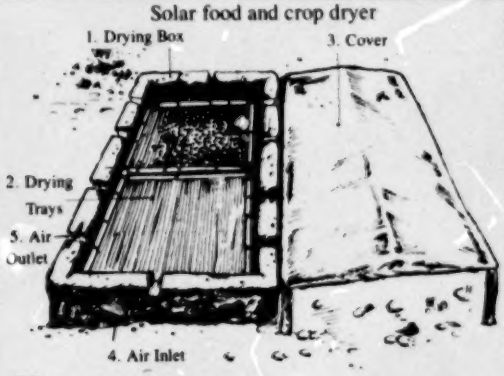
Information on these pages has come from a variety of sources, including the Appropriate Technology Sourcebook by Darrow, Keller and Pam (Publishers: Volunteers in Asia); A.T. International, Washington D.C.; the Peace Corps; Volunteers in Technical Assistance (VITA), Arlington, Virginia; and UNICEF Country Office publications.

1. Clay pot
2. Water
3. Small stones = 1/2 inch
4. Gravel = 1/8 inch
5. Fine Sand
6. Gravel = 1/8 inch
7. Broken charcoal = 1/8 inch
8. Gravel = 1/8 inch
9. Small stones = 1/2 inch
10. Large stones = 1 inch

9. Using the sun

ICEF 9002/Upper Volta

Solar food and crop dryer



Source: Village-level Technology, Bangkok (UNICEF)

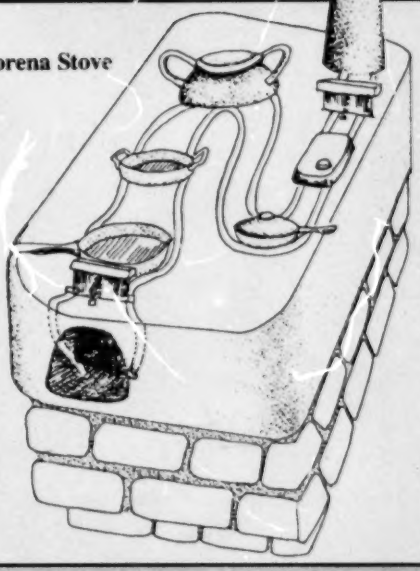
The most renewable, and the most abundant, energy source of all is the sun. But it is also amongst the most difficult to utilize because the technology required to focus its diffused form is expensive. However, its most common application in the Third World, in crop drying (above right), is rather easily accomplished, and has the additional advantages of higher temperatures and lower humidity as well as protection from dirt and pests. Solar cookers, on the other hand (left), are not practical and are expensive to construct.

10. Cooking Stoves

Traditional stoves or three-stone open fires waste fuel because they impart heat very inefficiently, but a host of simple, low-cost improved stoves have been developed. Amongst the best-known are the Lorena (**below right**), which can be built with sand-soil blocks to a variety of sizes and designs; and the improved "angita" or "jiko" (**below**), which are being promoted by many groups in Africa and the Indian subcontinent.

UNICEF/Phil Hassrick

Lorena Stove



Source: Renewable Energy Dictionary (VITA, 1982)

India

Try asking the women first

Surprisingly, development programmes intended to improve rural life in poor countries often fail to gain their beneficiaries' acceptance, much to the vexation of social planners. ANIL AGARWAL suggests that one reason is the lack of attention paid to identifying the needs and interests of women. Men, who are frequently less directly affected by the technological innovations, tend to make the important decisions.

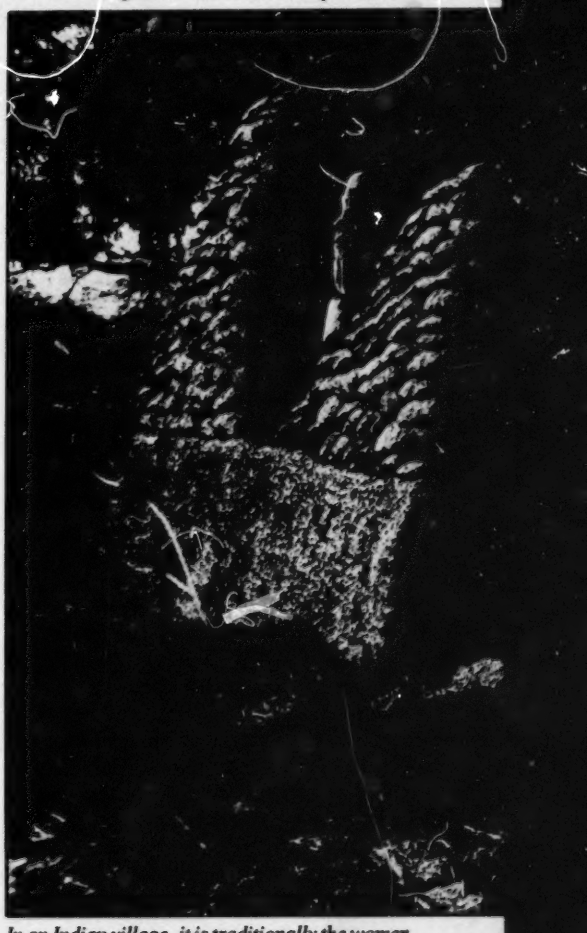
An enormous amount of human labour and natural resources are consumed by routine domestic functions. Efforts to conserve this "wasted" energy, and use it more productively, have brought into being a wide array of energy-efficient "gadgets" intended to relieve household drudgery. Appropriate technology practitioners in particular have tried to devise ways and means to ease burdens that rural people have always lived with. India's efforts have included energy-conserving smokeless chulhas (woodstoves) to cut down substantially the back breaking labour involved in wood-gathering; biogas plants to protect forests and trees by producing energy currently generated by wood-burning; and handpumps to provide villages with clean water and spare the long journeys to far away rivers or ponds.

Strong as are the needs – and arguments – for such new technological improvements, they have never yielded the kind of success they promised at the outset. The reasons which explain many of these failures are diverse, but a common thread seems to be the inadequate attention paid to their impact on those most directly affected: women.

As a rule, most projects which disseminate new technologies in rural areas carefully study their expected impact on the lives of the poor and the disadvantaged. Will they accept the innovations? What direct benefits will accrue as a result? Will the economic dynamic unleashed by the introduction of the new technologies work in their favour or compound their poverty? But there is one mistake the questioners have often made: they have treated the poor as one monolithic entity. In fact, two distinct groups comprise the poor: men and women. The interests of the one are not necessarily served when those of the other, or even of the whole community, are being catered for. Some schemes actually introduce practices which increase the already disproportionate burden borne by women.

The story of the comunity biogas plant in Fateh Singh Ka Purwa, a village in Uttar Pradesh, reveals how these conflicting interests can affect a project that looked certain, on paper at least, to succeed. The plant was hailed as a major breakthrough: it was the first to serve an entire village in India, and every household, rich and poor alike, was "hooked up" It produced the amounts of energy that it was designed to produce, and began to be heralded as an example of how appropriate technology could transform village life. And yet, a little over a year after its inauguration, it stopped functioning.

It was not diffficult to ascertain why. The plant had been designed to provide cooking energy for the village. But the community leaders who helped launch the project – all men, of course – soon began to stop supplying cowdung to feed the plant. Why? Because they did not find that the plant was meeting *their* needs: energy to power irrigation pumps, chaff cutters, and milling machines. The fact that their womenfolk were being spared the aggravation of long firewood searches did not motivate them sufficiently to continue supplying the plant with cowdung. And because the women had not been organized, because they had not been involved in designing the project, they were unable to keep the plant running after



In an Indian village, it is traditionally the women who make and store the fuel: in this case, flat cakes of dried cattle dung. UNICEF 034/83/ India/Black

Anil Agarwal is Director of the Centre for Science and Environment, a non-profit research organization in New Dehli set up to increase public awareness of the role of science and technology in national development.

the men withdrew their participation.

Other studies have also pointed out that new adopters of biogas plants are less interested in cooking energy compared to the other benefits they offer. The Indian Council of Agricultural Research has reported that farmers in Punjab and Haryana look upon biogas plants more as compost-making units, with cooking gas only an incidental byproduct. Reports from China have also stated that biogas plants first became popular there because farmers could compost human excreta with them, which otherwise had to be used raw and was a hazard to health.

Are family-size plants better?

One way of meeting the need for cooking energy might be the establishment of private rather than community biogas plants, since the operation of a family plant will more easily remain under the control of women. Community decisions in India – and in most third world societies – are invariably the preserve of men, and it is clear men are unlikely to go out of their way to support the lessening of women's burdens if that conflicts with their own perceived interests.

But private biogas plants pose their own problems. They can only be operated by the 10 per cent of India's farmers who own at least four or five head of cattle, the minimum required to fuel a family-size plant. Such plants will therefore benefit richer households only, and, what is worse, will adversely affect the poor who will no longer have access to the richer farmers' cowdung.

The Indian experience with fuelwood plantations – aimed at replenishing the rural energy reservoir depleted by the cutting of firewood – provides another instance of how men find it difficult to reconcile their own interests with those of women. Very few such plantations have thus far been successful, despite the number of hours women and sometimes children spend searching for firewood.

One reason is the men's desire to plant fruit trees to provide some cash income, rather than trees for fuel and fodder. This was the case in the Himalayan district of Chamoli, where the Chipko Andolan movement against deforestation has been mobilizing the villagers to take part in tree-plantation programmes. When the village assembly was first asked to make its choice of trees to be planted, the men immediately answered: "Fruit trees." Fortunately, the women of Chamoli were braver than those in Fateh Singh and argued that fruit trees would get them nothing. "The men will take the fruits and sell them by the roadside. The cash will go to buy liquor and tobacco. No, we want fuel and fodder trees," they argued. Eventually, both types of trees were planted.

Because of their ability to involve women, the Chipko volunteers are today running the country's largest voluntary afforestation programme. While the men help initially in planting the trees, the regular care of the Chipko plantations is undertaken mainly by village women. Whereas trees planted by the forest department seldom have a survival rate of more than 50 per cent, the Chipko plantations have a survival rate of nearly 90 per cent. The Chipko episode is one of a series of recent spontaneous events in which women of the area have risen up to protect their last remaining reserves of fuel and fodder not just from the axes of the lumberjacks but also, on several occasions, from their own cash-hungry sons and husbands.

Water supply and sanitation similarly provide examples of how technological innovations can sometimes add to the burdens women carry. The introduction of community handpumps is a significant step toward clean water and the reduction of child deaths caused by diarrhoea, the world's greatest killer of children. But clean water is only one part of the picture: the other is personal hygiene, particularly washing hands which become easily contaminated in most Indian rural areas because of the absence of sanitation. So health workers are correctly spreading the message of frequent washing of hands – which of course is only possible if there is water within or very near the household. Since most rural homes are not close to a water source – even most community handpumps are between 100 to 400 meters away – the new health teaching has meant in practice increased burdens and drudgery for women who must now carry greater amounts of water for the family.

Men, women and sanitation

It is also interesting to look at sanitation programmes in both rural and poor urban areas and see how their poor progress might

have been affected by the sexual dynamic. The number of rural people in the developing world without access to adequate sanitation has been going up steadily: 1,100 million in 1970, 1,200 million in 1975, and 1,425 million in 1980. WHO figures show that the urban population served with adequate excreta disposal facilities has also decreased from 71 per cent in 1970 to 53 per cent in 1980. The International Drinking Water Supply and Sanitation Decade (1981-1990) was therefore an effort to counter this trend through the provision of clean drinking water and adequate sanitation for all by 1990. But, even before the Decade began, many countries told the United Nations they could not meet the set targets. India, for example, has more or less neglected rural sanitation after initial attempts in the 1950s. The usual explanation is that these programmes require changes in deep-rooted behaviour which are difficult to accomplish.

Sanitation measures are obviously of greatest interest to women because of the privacy enforced upon them by society. Men squat whenever and wherever they wish, unlike women, who often have to wait with great difficulty until after sunset, or find secluded clumps or bushes. Sometimes such women miss lunch so that they can hold on for a longer time. "I learnt the feminist aspect of sanitation," remarks a middle-class urban woman from Delhi, "when I went out to a village in eastern Uttar Pradesh. There were no toilet facilities in the village; the land was dry and parched for miles around; and, no tree to hide behind. Like the village women, I too had no choice but to hold my urge until dusk."

Voluntary groups working in the slums of Bombay are finding that the realities of life have made women particularly anxious for private toilets. They wait until after sunset and have to look around for isolated spots: just the places that leave them open to rape and molestation. Is it a wonder that many are beginning to feel that the lack of urgency about sanitation programmes is at least partially related to men's relative ease about the problem?

Clearly, development planners must become more fully aware of women's needs and interests if they expect their technological and social innovations to find wide acceptance. But even more crucial is the need for the hard-pressed women to take the lead, organize and assert themselves in ways that the community or nation will find difficult to ignore. □

Senegal

The flour didn't taste right

The imported millet mills installed in the villages were always breaking down. Worse, the village women found that their husbands didn't like the taste of the flour they produced because it could not be moistened or fermented before milling. Daouda Seck, a local craftsman, was the pioneer who worked out how to modify the mills to prevent them breaking down, and to produce the flour the villagers like. Now other craftsmen are being trained. By NORBERT ENGEL.

You could see the women from the main road. There, in the shade of a magnificent broad-leaved tree, a dozen women and several young girls were standing pounding millet in mortars. Their arms holding the pestles swung rhythmically as they lifted them and let them drop. The women laughed and sang, and from time to time would throw the pestle high into the air, clap their hands, catch the pestle again before it fell back into the mortar, and go on pounding. Some of the women carried children on their backs.

Many visitors passing through this region have remarked upon the splendid sight of women pounding millet, carrying children on their backs or carrying huge jars of water or bundles of wood on their heads. But these unforgettable images of Africa also reflect the realities of rural life: these tasks are the hardest and most tiring that women have to do.

In the arid regions of Senegal, where because of the soil and lack of rain, millet and sorghum are the only cereal crops that can be grown, women must pound grain twice a day. First they must separate the grain from the stalk, then they must mill the grain.

Here in the village of Morry Laye not far from the town of Kebemer, most of the women no longer have to perform these exhausting and arduous tasks. Nine months ago, after a harvest that was slightly better than that of previous years, the villagers decided to buy a millet mill. Of course, Morry Laye is not the only village with a mill, but this is a very special one, made (apart from the motor that powers it) by a village craftsman. The locally-manufactured millet mill is an improvement over the imported mills installed elsewhere, according to the Morry Laye villagers.

Traditionally, before the millet or sorghum is ground it is either washed or moistened to trigger fermentation of the grain. This gives food a better taste, especially in the preparation of *"lakh"* (millet porridge) or *"tiéré"* (couscous).

"You see, imported mills are different from ours," says one of the women in front of the hut housing the millet mill. "You can't use wet grain in the imported mills. You must always use dry grain and this doesn't give the same taste. Even my husband complained about it – he doesn't like the imported mills. Some women even have to resort to old-fashioned pounding methods because their husbands won't accept the new taste."

Apart from the taste, there are plenty of other problems with the imported mills. For instance, the sifters may be too small and they may clog, with the result that it takes a tremendous amount of time to mill the grain, and fuel consumption is considerably increased.

"The imported mills gave us paste"

"With our mill we have no problems. We use moistened millet and the flour comes out

Norbert Engel is a UNICEF *Communications Officer based in Dakar, Senegal.*

Milling the grain adds to its nutritional value because now the rich stalk is also ground as part of the flour. UNICEF 037/83/Senegal/Engel

very white and fine. This did not happen with the imported mills, which gave us a kind of paste." The woman gives her calabash full of millet to the miller, who weighs it: three kilos. He starts up the motor and throws the millet into the mill. In less than three minutes, it is completely milled. A beautiful flour – fine and white – pours out.

When we ask "How long did it take to pound three kilos of millet in the past?" the woman smiles and says: "With my two daughters helping me, it used to take me two to three hours a day to pound our grain." Now it takes three minutes. In addition to the time saved, there are many other advantages.

With the traditional system – pounding, winnowing, washing and pounding again – as much as a third of the grain was often lost. Also, the grain was first separated from the stalk and the latter, although of great nutritional value, was fed to the livestock. With the mill, the stalk is finely milled and eaten with the flour. Local mills can also be used equally well for millet and sorghum and for peanuts and cassava. Different-sized sifters can also produce flour suitable for making couscous.

Bruno Gabrielli, technical adviser at the UNICEF Office in Dakar, told us the story of the millet mills made by local craftsmen.

During my field visits, I noticed that many millet mills were not being used properly or were simply out of operation. At Kebemer, I made contact with a craftsman who on several occasions had repaired mills that had broken down. This young 30-year-old craftsman, Daouda Seck, had trained at the Thies Horticultural Training Centre and had specialized in agriculture. He was much sought after by the villagers to repair imported mills that had broken down, and he tried to adapt the mills to people's needs. All the while he analyzed the deficiencies of these mills and even modified some of them.

"Often the mill suppliers had installed them wrongly and this resulted in abnormal vibrations in the equipment and cracks everywhere which in the long run damaged the mills beyond repair.

"He explained that, in his view, the sifters must be changed so that moistened grain could be used. Also that the abnormal vibrations must be eliminated by balancing the rotor and hammers better."

UNICEF's Bruno Gabrielli added: "Villagers receive equipment without any instructions or prior training, with the result that the equipment gets spoiled very fast: there are breakdowns due to lack of technical know-how and the way the machines are used." To remedy this situation, Mr. Gabrielli recommended setting up a millers' training programme and a mangement committee. "The equipment the villagers receive is not always appropriate to their needs and that is why we have organized a training course for rural craftsmen."

When he saw the mills that Mr. Seck had made, Mr. Gabrielli suggested that Mr. Seck exhibit one of his mills at the Dakar craftsmen's exhibition. This was a resounding success and the Ministry of Social Development asked UNICEF to organize a training course at Kebemer to teach rural craftsmen how to make millet mills. The locally-made mills offer numerous advantages: they are installed by the craftsmen who make them, and these craftsmen train the millers for a week in their local language. The craftsmen also guarantee that the equipment installed will be monitored and maintained for a year following its installation.

The price of the mill, which costs between US$1,500 and US$2,000, includes installation, the miller's training, and the maintenance of the equipment for twelve months. This is less than the cost of an imported mill, and far better adapted to the villagers' real needs, particularly because there are no husbands complaining about the odd taste of the milled products.

A local craftsman has a vested interest in making good mills and training good millers: it is good publicity for him.

The first training course for rural craftsmen in the manufacture of millet mills was held in December 1982. The course was designed to standardize mill manufacture and to ensure that mill parts, screens, roots, and blades are interchangeable.

"The course was a great success. We all talked a lot about the shape of the mill and its design, and in three days we made one. Everyone did his bit," Bruno Gabrielli recounts. "As a start, we are going to manufacture 100 mills as part of a project to promote equipment intended to lighten women's work. This project will be financed by ILO, UNEP, and UNDP. The aim is to relieve women's burden so that they have time for other things and can take part in educational and remunerative activities. Improving the life of rural women should have a decisive impact on the improvement of society." □

Sushila wants a new kitchen stove

On the precarious hillsides of Nepal, it is becoming more and more difficult to gather firewood. A more fuel-efficient cooking stove has its appeal, but the do-it-yourself approach had its drawbacks. A prefabricated model is now becoming popular.

By GEORGE McBEAN.

Dust fills the air, allowing the sunlight to penetrate the bare mud-walled room in sharp channels of light. Sushila surveys the empty space where only yesterday had stood an earthen clay stove of the type which had served her mother and her grandmother before she was born. Now she puts her energy into brushing the last traces of baked earth from the floor and through the crude wooden door. Outside the house she sweeps all the clay dust a few yards to the edge of the hillside, and in one well-practised stroke, over the edge into one of nature's larger dustbins: the 3,000 foot Khopasi valley.

Sushila's family, like other hill farm families in Nepal, leads a life of extreme hardship. Clinging to the steep hillside, the farm provides only the most meagre of livings. The family is dependant on a few animals, and the crops they manage to cultivate on the narrow terraces of their small plot of land. Sushila and her children must play their part in the backbreaking labour of daily living, clambering for hours over rocks and steep paths to fetch water, and bundles of firewood and fodder. As the forest areas are depleted, Sushila has found that collecting wood is becoming more and more difficult.

Her preparations for the day's event are almost complete. Mr. Sharma, the group leader from her village Small Farm Family Programme, will soon arrive with workmen to install a new stove, "the smokeless *chulo*". She has been told that it will cost her 75¢ for installation and will take only a few hours to fit; that it will save up to 40 per cent of her firewood and will leave her kitchen smokeless. Now she waits on the shaded side of her two-storey home, hoping she hasn't bid goodbye to the old stove too soon.

Fuel-efficient stoves are not new to Nepal. Because the idea is based on such solid common sense, many people have designed and promoted the use of fuel-saving stoves over the past several years. Nearly every household in Nepal uses wood for cooking, and the devices used in kitchens range from a simple three-stone fireplace, to elaborate clay-modelled, four-burner stoves, all following traditional designs. The majority of stoves allow the smoke to fill the room and escape only through windows, doors and cracks. This smoke-filled environment has been blamed by health experts as being the cause of many eye and lung problems in children and women.

Do-it-yourself didn't work

Until recently, many appropriate technologists believed that new improved stoves built on traditional designs using locally available materials should be built by the owners. Although the idea was appealing, those who actually tried it found it a most demanding job. The design and production of information materials, the training and education given to household owners on how to construct the stoves, constant explanations as to the principles involved and what to do about maintenance, were all very time-consuming. A quicker way of advertising the benefits and encouraging the installation of fuel-efficient stoves had to be found.

Now the introduction of more fuel-efficient prefabricated stoves is meeting with tremendous interest. These stoves are made of fired clay by traditionally trained potters working in several different places around the country. Moulded on giant wheels which are skillfully turned in a pot-stirring motion, the potters' dexterous fingers shape both stove and chimneys, leaving them for two weeks before firing.

A good potter can mould up to 20 stoves in one day. After completion of the component parts, the stove is transported by potters to the construction site, where it is fitted neatly into the kitchen area, again using locally available mud, bricks or stones. The chimney pipes are then butted together to lead the smoke out of the house.

The main advantage of the prefabricated stove seems to be that the interior part of the stove – which contains the precise dimen-

Sushila contemplates her new stove. A chimney carries the smoke outside the house, and she expects to save a lot of fuel. Photo: McBean

George McBean is UNICEF's Project Support Communications Officer in Kathmandu.

sions of holes and channels – is the same in each model, keeping the fuel-saving design intact. In the past too many modifications by inexperienced craftsmen not sure what they were doing, or why, changed the essential dimensions, causing a reduction in the efficiency of the stove. Now new owners can mould the surrounding of the stove into whatever shape, traditional or otherwise, they would like without ruining the efficiency. Of course, instruction in maintenance and repair is still essential, but generally the skills needed for maintenance are far less complicated than those required for a complete construction.

This new attempt to introduce prefabricated stoves into Nepal is now being supported by His Majesty's Government, UNDP, FAO and several aid programmes. UNICEF, in collaboration with Nepal's Agricultural Development Bank, have devised a way through their Small Farm Family Programme which allows villagers like Sushila to acquire a stove free. A stove costs $5 to prefabricate in this way and it is hoped that after the initial introductory free offer, potters will promote and sell the stove at this price to the public. UNICEF plans to provide 1,000 stoves in some of the most wood-scarce areas of Nepal over the next year.

Sushila would be regarded by most Nepalese as a modern woman, because she has taken a chance and chosen a new improved cooking stove over the old time-tested traditional. She has overlooked some of the disadvantages that the new stove owners have described, like the increase in insects in the house because of the lack of smoke, and absence of a visible flame to light and heat the kitchen area.

She has been attracted to the idea that she will not need to spend so much time gathering wood, and that her children may be tearless and cough free. She knows little of the overall implications of using less fuel for a deforested country like Nepal, rapidly approaching a fuel crisis. But she has correctly assessed the advantages of change for herself and family.

The stove itself is not yet perfect and there appears to be some room for technical improvement. However, the most important suggestions for improvement will come from women like Sushila who use it. In this way, it will become better suited to the life it was designed to aid. □

The new smokeless "chulos" are prefabricated. Local potters are trained to make the interior part to precise specifications. Photo: McBean

El Salvador

Was it the wrong stove?

Inside El Salvador, conflict has caused a great dislocation of people. As part of the effort to help them, an energy-saving cooking stove was introduced. In spite of sound planning, the stoves were not very popular. What went wrong? By FRANCISCO JAVIER SANDOVAL.

The conflict endured by the small Central American Republic of El Salvador in recent years has brought into being a new category of people: "displaced persons". Most of them are very poor agricultural labourers with large families, who have fled the scenes of fighting and taken refuge in camps, parks, churches, schools, or in the homes of friends and relatives. Over 60 per cent are ▷

Francisco Javier Sandoval is UNICEF's Communications and Information Officer in Central America.

mothers, or children under 15 years of age. The suffering of all these people whose names and faces are unknown to us is the greatest tragedy of the conflict.

It was originally the idea of Save the Children that the introduction of an energy-saving stove would be of assistance to many of these families. Wood is the main source of fuel for cooking in rural parts of Central America, and many of these displaced people were finding it difficult to obtain supplies. A model of stove called the Lorena was known to make possible a fuel saving of 40 per cent.

The proposal was discussed with UNICEF and with officials from the El Salvadoran Ministries of Planning and the Interior. In August 1982, ten teams of promoters, each consisting of one man and one woman, began to give out information and guidance on the virtues of the Lorena stove, and show the people how to build them.

Lorena stoves have to be carefully used. The door hatches have to be opened and closed periodically to keep the heat circulating. Photo: Sandoval

Each team covered a specific area. They held meetings in each community, at which they gave practical demonstrations. A few days later, they returned to the community and joined interested families in constructing the stoves in their own homes.

In the first four months of the project, 189 Lorena stoves were built.

Early in 1983, the different agencies involved in the project carried out an evaluation to find out how well the stoves had been received. In spite of proper planning and implementation, the project has not met with the success anticipated. There are social obstacles connected with any technological innovation, and these have hampered the widespread adoption of the Lorena stove, as the evaluation team quickly discovered.

Not much saving in fuel

By comparison with the open fire or hot stone slabs used traditionally for cooking, those using the Lorena stoves had managed a saving in fuel of only 13 per cent, much less than the expected 40 per cent. What had gone wrong?

Lorena stoves, in order to achieve their maximum efficiency, have to be very carefully used. The door hatches on the stove need to be opened and closed periodically to keep the heat circulating. Different dishes must be cooked simultaneously so as to maximize the use of fuel and heat. Sticks should be placed under the cooking pot in the shape of an X in order to achieve optimum combustion. And the chimney, or funnels, need to be regularly cleaned.

It is the failure to observe these handling precautions which largely explains the low efficiency of the stoves. But it is hardly surprising that peasant women with no education do not appreciate why these technological niceties are important or find it easy to apply them. It is very difficult for them to conceive that it is the heat radiated, rather than the visible flame, that gives the high temperature which leads to a shorter cooking time.

Only 45 per cent of the heads of household who took part in the promotion drive finally built a stove themselves. Why did so few families decide to adopt it? According to the evaluation, the building costs of the stove were to blame. These worked out at the equivalent of US$18. By contrast, all that is required for a stone slab or open fire is to collect a few stones, dampen the earth, and place them in a certain pattern. The Lorena stove is cheap from a planning point of view, but for the rural family its costs are not inconsiderable, particularly when – as in this case – almost all the heads of household are women with no paid employment. The subsidy provided by the sponsoring agencies turned out to be too low, given their lack of means.

A cooking stove is a permanent appliance installed in the home, in the view of these rural families. Most of the displaced persons expect to go home sooner or later. To many, it seemed incongruous to be building a Lorena stove when they will probably have to destroy or abandon it before long. This factor also told against the adoption of the new technology.

Not a failure with everyone

Among those who did build a stove, there was a great sense of satisfaction at having a new cooking system. We talked to people in the camps who had even discovered features in the stove not foreseen by the promoters.

The most outstanding advantage for both the users and their neighbours was the lack of smoke, which was seen as a great advantage by the home-maker. Studies recently undertaken by the Nutrition Institute of Central America and Panama (INCAP) have found that the imprisonment of smoke in poorly ventilated houses has the same effect on people as a high consumption of cigarettes

Families who had installed a Lorena stove had improved their standard of health, according to the evaluation. They were less prone to irritated eyes, headaches, coughing and lung trouble, bladder pains, skin stains, and rheumatism. The chances of accidental burning among the children were considerably reduced, and mothers found that they had more time at their disposal after cooking chores were done..

The evaluators concluded that however many objective advantages a new item of technology may appear to have, it must meet individual and social requirements. If these are ignored, they will later emerge as an unpleasant surprise and interfere with the item's adoption. "Appropriate technology" is only truly appropriate if the benefactors see it that way. □

A visit to CENEEMA

by Jacques Danois

Is it just a shed? An ordinary warehouse?

Is it a showroom open to all the hot winds of Africa?

Does the equipment we see here come from a factory, or is it due to go back to one for an engine, a fuel tank, belts or bands, transistors or other technological devices?

Absolutely not.

The forges and pedal mills we see here are complete. No need for petrol, fuel oil or electricity. They run on people power.

They are waiting for the farmers from energy-poor areas, or places too far from major urban centres to be regularly supplied with fuel, to come for them.

On this continent of Africa, as bristling with truths as with contradictions, with instant appetitites as with age-old traditions, people must know how to learn from the past in order to create the present and foresee the future.

It took some time for the comfortable world of the West to agree to listen to Africa instead of continuing to impose upon her an endless one-way monologue, the inheritance of the colonial era.

This seems to be changing here, where sharing is the byword.

The machine-tools on show at CENEEMA are the produce of the custom-trained imagination adapted to modern life.

Using the physical strength of people rather than awaiting the utopian arrival of combustible fuels is at once pragmatic, bold and intelligent.

All the invented—or reinvented—tools and implements that CENEEMA produces, manufactures, and builds, stem from a happy conjuncture between a lack of means and simple, self-evidently practical ideas. Such a mix offers visitors a world both old and new, where not only the countries of Africa, but so many other developing countries, can gather technological wealth and—more significantly—human benefit.

In Asia, deprived populations have managed to adapt and digest technological creations from the industrialized world mastering them and "Asianizing" them to fit their own needs. Africa, for the most part, has thus far not shown the same interest in adapting ideas coming from abroad. Imported technology has just been accepted as it stands, with all the expense that was entailed.

The tools that CENEEMA manufactures stem from a happy conjuncture between a lack of means and self-evidently practical ideas. UNICEF/035/83/Cameroon/Danois

Improved technology from Europe or the United States has existed side by side with, and superimposed upon, customary life—or what was left of it.

A place like CENEEMA shows how the dark continent, while too unassuming as yet to "Africanize" technology from abroad, also has the power to adopt new ideas suited to people's particular needs, employing both traditional experience and the practical means at hand.

Does this mean that everything is for the best and the reinvention of systems is bound to work miracles every time?

Not at all. There are times when the old rules—excellent in themselves—prevent the use of practical methods that could help rural populations to live and produce more and better. This is true in particular for the collection of refuse and human waste and their conversion into fertilizer. These are problems also encountered in sanitation projects designed to control the building of latrines near human dwellings.

A delicate topic since one does not talk openly about certain bodily necessities.

Further, it seems unacceptable to grow food with the aid of what was once... CENEEMA has side-stepped this difficulty by producing biogas using waste and refuse whose mention or usage custom frowns upon. Vegetable matter and household rubbish are also used, thus avoiding any offence against local taboos.

It is not just CENEEMA's production and manufacture of agricultural machine-tools that is important. Above all, there are possibilities for ongoing research and the study of appropriate technology.

A visit to the workshops and storerooms gives the visitor an impression of walking through a museum of the future, where not only the outcome of practical work is displayed, but also the reflection of the will and imagination of Africa to overcome the technological deficiencies of rural life. □

Jacques Danois is Regional Information Officer in UNICEF's Abidjan office.

Finding the middle that disappeared

It began as a "small" idea in the mind of E. F. Schumacher, an economist with Britain's National Coal Board, when he went to serve as an economic adviser to Burma. But that idea, elaborated in Schumacher's book *Small is Beautiful*, has become the motive force behind one of the most significant schools of modern development thinking. JOHN MADELEY looks at where it has led.

In the mid-1950s, a relatively little-known economist with Britain's National Coal Board went to work for the first time in the developing world as an economic adviser to the government of Burma. Years later, E. F. Schumacher wrote how this six-month Burmese assignment, followed later by work in India, alerted him to the absolute incongruity of locating advanced industrial technology in essentially agrarian economies and cultures. This technology made little use of the developing countries' greatest resources – people – while its need for capital and sophisticated skills contributed to making the developing countries even more dependent on the industrialized world.

In addition, he wrote, a modern factory employing a relatively few workers might be appropriate for Pittsburgh, or Sheffield, or Tokyo, but not for rural India and the bulk of the Third World, where for every employed factory worker were hundreds of others desperate for similar work which could never be provided. Worst of all, Schumacher argued, was the virtual monopoly of advanced technology and its benefits by élites in the developing world, which left the population in the rural areas worse off than before.

It was this series of observations which led to Schumacher asking himself: What is the most appropriate technology for rural India or Latin America or even their city slums? Clearly, the answer wasn't to revert to the traditional indigenous tools – they were not and had not been efficient enough to speedily propel people out of poverty. What was needed was an intermediate technology that would be an advance on village-level crafts but still be simpler, cheaper and easier to maintain than the machines developed in the industrialized world. A technology which, in Schumacher's words, would be "non-violent," and would not undo the natural cultural, economic and ecological cohesion of rural societies.

E.F. Schumacher

The problem was: "Intermediate technology was nowhere to be found," wrote Schumacher. *"The middle had disappeared."*

While Schumacher might not have been the first to observe the absence of this "middle" technology, he is widely recognised as having first formally articulated its need. As Witold Rybczynski has written in *Paper Heroes:* "It would not be an exaggeration to say that without him there would have been no Appropriate Technology movement."

So it was that the Intermediate Technology Development Group was formed in 1965, with Schumacher as its head and his friends George McRobie and Julia Porter assisting.

The new group then had no money, no legal status, no broad support and no contact with the developing world: it was only an idea. But not for long: *The Observer* published an article Schumacher wrote, and the response was immediate. Letters of support poured in from around the world, and a volunteer panel of scientists and engineers constituted itself to help answer the enquiries that flooded ITDG offices.

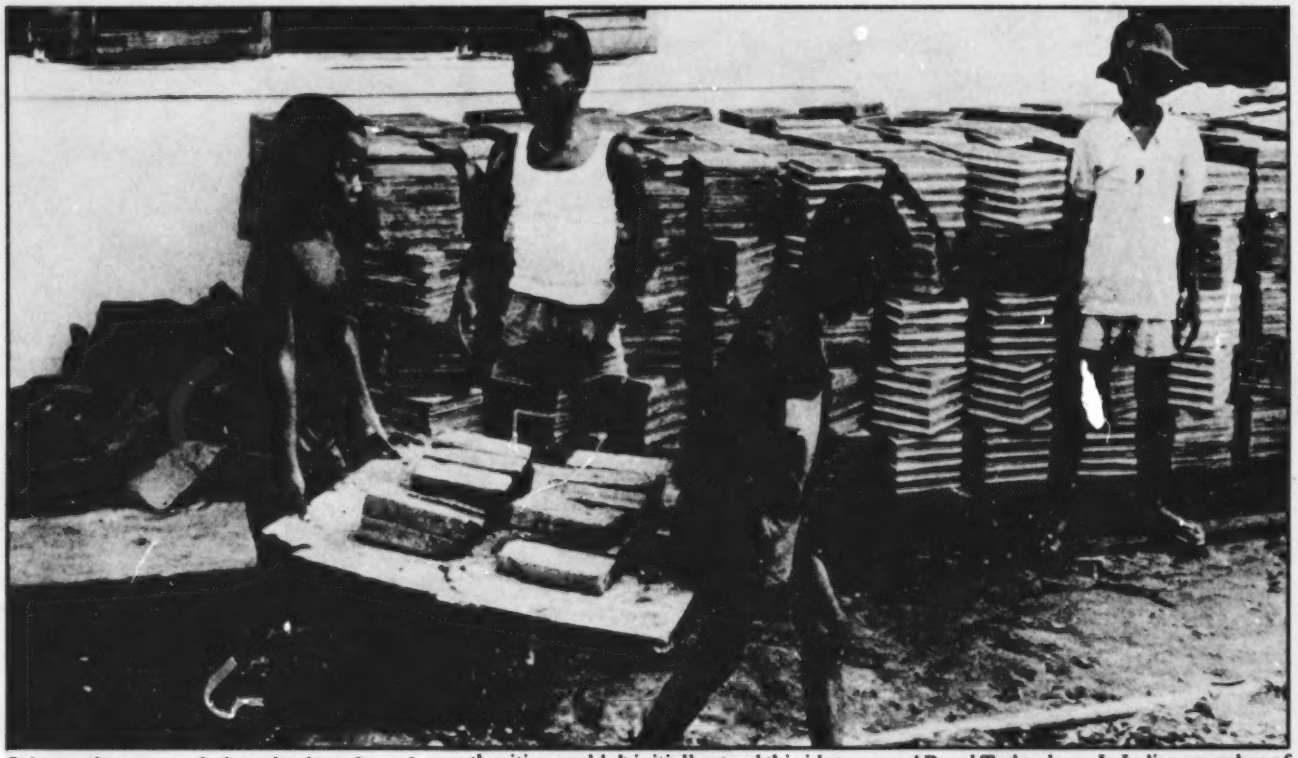
"What are they going to flog in Nigeria?"

The group's first major practical exposure to the "export" of technology came through a British trade mission's visit to Nigeria. When news of this visit arrived at the ITDG offices, said Schumacher later, "We thought, my goodness, what are they going to flog in Nigeria? Certainly not the stuff that Nigerians really need." The group therefore hastily put together a catalogue of hand and animal-propelled agricultural equipment that was available in Britain and persuaded agriculturalists going on the mission to take it along.

To their astonishment, the agriculturalists found that the ITDG catalogue was "literally torn out of their hands." Nigerians were saying to them, "For the first time you have brought us something of interest, something appropriate, instead of the usual glossy catalogues." What the mission thought was a favour being done to the Schumacher group had turned out to be a service to Nigeria.

The group, by now convinced that they were on the right track, identified three clear tasks for themselves: to catalogue and disseminate information on low-cost, labour-intensive equipment and techniques, usually for small scale application; to publicize the IT concepts; and to assist specific projects in developing countries. Specialist panels on different subjects were established to give advice. The earliest panel, on building, was set up in 1968. Its first project was to find ways of improving the efficiency of small building contractors in Africa. The panel felt that this was essential if local people were to successfully compete with,

John Madeley is a UK journalist specializing in development issues.



Schumacher argued that the benefits of technology were unevenly distributed, and often left the poor worse off than before. ICEF 8136/Danois

and eventually take over from, foreign concerns.

It did not take long for the world to realize that IT was not merely a good idea but a practical necessity for a world then obsessed with grandiose, energy- and resource-consuming schemes. With this realization came support of a more concrete kind: cash contributions. By 1972 the group was spending around $300,000 a year; by 1982 the amount had risen to $2.8 million. In the 18 years since the group was founded, it has advised people in virtually every developing country about an enormous range of subjects – from solar pumps to steam engines, from wood stoves to windmills, from dams to dentistry equipment.

Success, especially to begin with, was accompanied by strong strands of opposition. Although voluntary groups in over 60 countries are now involved in IT ideas, Third World governments were slower to respond. Their main objection was based on their perception that IT proponents believed the developing world to be incapable of handling sophisticated western technology. "For example," relates George McRobie, who took over as ITDG's chairman after Schumacher's death in 1977, "the Indian authorities couldn't initially stand this idea. They didn't like the word or the concept 'intermediate' – to them it meant second best, which is certainly not the way it was ever intended."

Intermediate technology requires decentralization

"The real problem," McRobie contends, "is administrative. Officials find it easier to administer a centralized, rather than a decentralized technology. Intermediate technology calls for a degree of decentralization that few developing countries are willing to accept."

McRobie believes that the "second best" notion that some people initially had of ITDG was in fact not the real obstacle. As rural organizations in developing countries showed that IT created new jobs and improved the quality of life, their governments became more sympathetic.

Over the years, therefore, ITDG has tried to overcome this problem by focusing on and working directly with those government departments which were interested in IT ideas, such as agriculture and rural development. The strategy has paid off. Pakistan is now funding intermediate technology centres. Tanzania's Ministry for Industry last year commissioned ITDG to provide the guidelines for a new parastatal organization, the Centre for Agricultural Mechanization and Rural Technology. In India, a number of state governments, including Uttar Pradesh, are giving IT political and financial backing.

This growing support is developing now, believes McRobie, because of the severe economic crisis facing many developing countries. Exhausted both of capital and foreign exchange, Third World governments have become more interested in developing their own low-cost technologies.

McRobie sees intermediate technology as a clear alternative to conventional economic ways of thinking. "Old style economics are at the end of the road," says McRobie. "The second Brandt report urges Western countries to help poorer nations overcome their debt problems, and then in the same breath it proposes to sell them more goods, which will again get them into deeper debt! There is only one alternative to the crisis the world faces, which is for countries to become more self-reliant, and develop, make and maintain their own technology."

McRobie is not blind to ITDG's weaknesses. Amongst the most significant of these, he accepts, is that IT specialists have not always harmonized their creations with the needs of the people they intend to serve. "We haven't spent enough time listening to Third World villagers," he admits. "It's only when engineers really listen long enough to what people want that they produce the most appropriate technologies." □

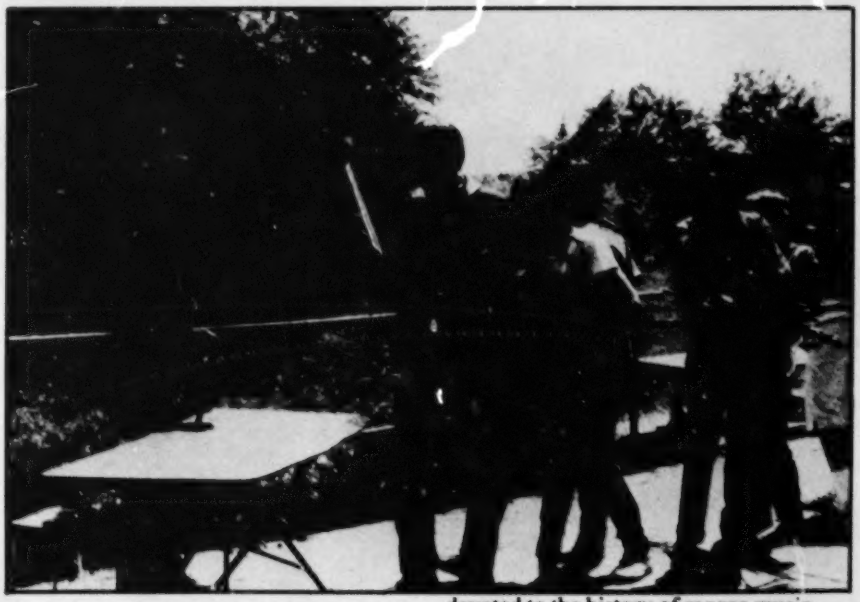
"Why are the palms of your hand white, Carlos?"

By Pierre Pradervand

A chance initiative by a primary school Swiss teacher has laid the groundwork for a new university-supported development education programme which might regularly bring together African, Asian, Latin American and Swiss students and provide encounters between these students and teachers interested in development education who are preparing for their diplomas at Geneva University.

The impetus for the prospective programme came from Pierre Clerici, a teacher in Nyon whose initial aim was much more modest: he wanted to acquaint his young students with Third World realities in a way that would be more meaningful than learning about them from textbooks and classroom lectures. The week that most Swiss schools spend in the countryside with relaxed curriculum requirements provided an ideal opportunity for Pierre's plans so he contacted friends from two twin Lausanne-based deved organizations: Service Ecole Tiers Monde (Third World School Service-é3m) and Service Information Tiers Monde (Third World Information Service-i3m).

Together, they devised a varied, and what turned out to be very exciting, week-long programme which, thanks to the quality of the participants and informality of the setting in the Jura mountains, was a great success. Staff participants included two Africans, one from Guinea Bissau who is now Cabinet Director of the Ministry of Foreign Affairs, the other from Rwanda.



Playing the game of being tricked and exploited: the children bring their "cocoa" for weighing. Photo: Pradervand

The week started with the 25 15-year olds cutting up Peter-projection maps of the world and assembling them in different ways. This turned out to be a most lively manner of showing how relative our view of the world is (e.g. in one of the "new" maps Oceania was right in the middle). At the same time, the youngsters discussed the history of colonization and the slave-trade, two major events of African history whose full impact on the continent's development is not fully understood in the industrialized countries.

Other activities included films and slide shows on food problems, an evening devoted to the history of reggae music and its African roots, and a visit to a local co-op store by the class which split into two groups and made a list of all the products originating in the developing countries. In conjunction with this last activity, the students participated in a novel simulation game invented by the former head of é3m and based on an African novel, *Ville Cruelle*, by Camerounian writer Eza Boto. The children enacted the selling of cocoa to the local non-African merchant, in the course of which the African peasants were tricked and deceived (the cocoa consisted of small bundles of wood symbolizing the produce and collected by the children in the local forest). The game was a lesson in "real-life arithmetic" and in portraying the helplessness of illiterate peasants against more sophisticated groups. It proved to be one of the highlights of the week.

Other outstanding moments were the African meals prepared every evening by Carlos, one of the Africans, with the help

DO YOU SUFFER FROM THE SAME DISEASES WE DO IN THE DEVELOPING WORLD?
OF COURSE NOT!
HOW LUCKY NOT TO GET NASTY AILMENTS LIKE VITAMIN A DEFICENCY
I SUFFERED FROM VITAMIN A DEFICENCY
YOU DID, TOO?!
WE HAVE MORE IN COMMON THAN I REALIZED
GREAT! I ONLY HOPE IT ISN'T ANOTHER DISEASE

of the children, during which quite an amazing "rapport" built up between them. An impromptu moment of African story-telling, with the accompaniment of soft African music, was followed by a no-holds-barred question-and-answer session during which the children asked all the questions one never dares ask, such as "why are the palms of your hands white, Carlos?" A final rally enabled the staff to evaluate the knowledge and attitude change during the week.

Plans have now been made to institutionalize this experience, thanks to the collaboration of a nearby university development institute (Institut Universitaire d'Etudes du Development – I.U.E.D. – of Geneva University), where a fair number of both Swiss and foreign teachers interested in deved are preparing for diplomas. Participation by African, Asian or Latin American students will be a high priority.

Local school authorities have expressed genuine interest and it is expected that the collaborative efforts of é3m and IUED will get off the ground in 1984. □

For further information write to: Pierre Pradervand, Service Ecole Tiers Monde, Ch. des Spinettes 10, 1007 Lausanne, *Switzerland.*

Concert in the Rain

By Keiko Nishino

When it first occurred, it was a frightening experience for 15-year-old Tokyo schoolboy Katsuto: there was a strange white dot in his eyes, a symptom of an ailment known as xeropthalmia which can lead to blindness. But doctors reassured him that his condition, caused by an acute deficiency of Vitamin A, would quickly improve with treatment, which it did. Within two months, his eyes were as good as new.

Two years later, when he was 17, the theme of a Chifuren (Regional Women's Organization of Japan) campaign caught his attention. The organization was raising funds to bring "Sight to Bangladeshi Children." Remembering his own experience, Katsuto became interested, and was shocked to discover that thousands of children in Bangladesh lost their eyesight every year simply because their country could not afford to provide the small doses of inexpensive Vitamin A capsules that were needed to prevent blindness (each capsule cost only 40 yen, or US 2 cents).

As people scurried for cover against the rain, a group of youngsters stood on the street corner playing their guitars. Photo: Chifuren

Katsuto was filled with anger about the inequality which existed among nations, and decided to do something about at least one of its consequences, the lack of Vitamin A in Bangladesh that Chifuren were campaigning about.

One stormy day, as people scurried for cover against the rain, a group of youngsters stood at a street corner playing the guitar and singing songs. It was Katsuto and some of his friends raising money for the children of Bangladesh! The unusual spectacle attracted hundreds of people, who stopped to ask what the boys were doing singing in the rain. The youngsters explained that about 17,000 children go blind in Bangladesh every year, and that in most cases the blindness could be prevented with a sum so small that it would be unfair for rich countries like Japan not to help. Sight for a child for just a few yen: that simple message, and the sight of idealistic Japanese boys staging a mini-concert in the rain, struck a strong cord of sympathy amongst passers-by.

In the late afternoon, with the sky now clear and the marathon 10-hour concert over, Katsuto and his friends counted what had been contributed: over half a million yen (about 2,000 dollars). Two days later they handed over the money to Chifuren officials who were absolutely amazed with the youngsters' determination and achievement.

The Katsuto story is one of many gathered by Chifuren during their Bangladesh campaign. Another concerns a six-year-old boy from Yokohama, near Tokyo, who sent 500 yen (two dollars) along with this message: "Going to school in the mornings, I walked instead of using the bus for ten days. It was a long way to walk, but I wanted to save money for my friends in Bangladesh." This little child, who until then probably had no idea where Bangladesh was on the world map, had been so moved by Chifuren's educational campaign that he now thought of the Bangladeshi children as his "friends."

By January of last year, 87.3 million yen (350,000 dollars) had been raised and given to UNICEF by 1,100 different groups and individuals including Chifuren. Mrs. Otomo, President of Chifuren, said at the time, "Even poor people contributed to this campaign from their limited budgets, because they saw what a small sacrifice on their part would achieve. Many Japanese mothers in particular sympathised with the Bangladeshi mothers of blind children."

With this contribution, at least 15 million Bangladeshi children under six years old were given a Vitamin A capsule in the spring of last year. □

New Board Chairman to visit Asian, African countries

The new Chairman of UNICEF's Executive Board is Dr. Haydee Martinez de Osorio of Venezuela. In that capacity, Dr. Osorio will make her first field trip to various African and Asian countries in January, 1984 to see programmes which the organization assists. She will later take part in a special pre-Board briefing to be organized by the Regional Office for Latin America next March, and will travel widely in Latin America before her term of office ends on 31 July, 1984.

The new Board Chairman has extensive experience in administering mother-child health and welfare services in Venezuela, where she is Director-General of the National Institute for Children, the country's major institution concerned with children's welfare. Dr. Martinez de Osorio has been an active member of the Executive Board since 1980, when she was Chief of the Venezuelan Delegation to the Board. Subsequently, she served as Chairman of the Programme Committee, and last year was elected one of the Board's four Vice-Chairmen.

UNICEF 036/U.S.A./Grant

Dr. Osorio, who succeeded Mr. Hugo Scheltema of the Netherlands, is the fourth woman to be elected Executive Board Chairman.

Other officers elected by the Board were: First Vice-Chairman: Umberto La Rocca (Italy); Second Vice-Chairman: Mihaly Simai (Hungary); Third Vice-Chairman: Atsu-Koffi Amega (Togo); Fourth Vice-Chairman: Dr. Richard Manning (Australia); Chairman, Programme Committee: Anwarul K. Chowdhury (Bangladesh); Chairman, Committee on Administration and Finance: Jassim Bu-Allai (Bahrain); Vice-Chairman, Committee on Administration and Finance: Mrs. Hisami Kurokochi (Japan).

The Board also agreed that the office of Vice-Chairman of the Programme Committee will be filled by a nominee of the group of Board members from the African region.

The 1983-1984 Executive Board is composed of the following members: Algeria, Australia*, Austria, Bahrain, Bangladesh, Canada, Central African Republic, Chad, Chile, China, Colombia*, Cuba*, Finland*, France, German Democratic Republic, Federal Republic of Germany, Hungary, India, Italy, Ivory Coast, Japan, Lesotho*, Madagascar, Mexico, Nepal, Netherlands, Pakistan, Panama, Somalia, Swaziland, Sweden, Switzerland, Thailand, Togo, USSR, United Arab Emirates, United Kingdom, United States, Upper Volta, Venezuela and Yugoslavia. □

**Elected at 1983 Board Session.*

Preparing for the Rome Board

Preparations are underway for the next annual UNICEF Executive Board session, to be held in Rome next April at the invitation of the Italian Government. It will be the first time in five years that the session is being held away from headquarters, and the first time since 1971 that it will be held in Europe. The Rome setting promises to make it one of the most well-attended Boards in recent years, since most of the UNICEF national committees are in Europe, which is home at the same time to the bulk of the world's NGOs and the source as well of over two thirds of the organization's contributions.

Two policy review papers are being prepared for the Board. The first one, on Monitoring and Evaluation, will present an overview of the policies, procedures and issues and contain recommendations for future action. The paper will be supported by two case studies – the Imo State Water and Sanitation project in Nigeria and the Indonesian nutrition programme – as well as a process-oriented presentation of UNICEF's capacity-building efforts in monitoring and evaluaton in eastern Africa and the Philippines.

The second paper will look beyond survival and Infant Mortality Rates to the complex web of interactions that influence Early Childhood Development.

The Rome meeting place is reflection of heightened Italian interest in UNICEF, to which Italy is now the second largest contributor (after the United States). In an intense fund-raising campaign between May 14 and June 4 this year, for example, over $3.2 million was raised for UNICEF through four call-in pledging TV shows organized by the Italian TV station RAI with the active support of the Italian National Committee.

UNICEF studies impact of recession on children

"In all that has been written about [what is the deepest, the most sustained and the most widespread] recession since the 1930s, the pre-occupations have been overwhelmingly and narrowly economic. The anaylsis has focused on inflation and interest rates, debt and deficits, unemployment and declining incomes. Few who write pursue the human consequences in more than a superficial manner. Even fewer are concerned with what the recession means for the billions of poor in the developing countries. And not a single international study [until this] has analyzed the recession's impact on the most vulnerable half of the world's population, the children."

Thus begins the introduction to a special new study entitled "The Impact of World Recession on Children" being published by UNICEF and based on eight specially-commissioned country case studies–on Brazil, Chile, Cuba, India, Republic of Korea, Sri Lanka, the U.S. and Africa. The study traces the very direct links between economic conditions and child welfare and takes an in-depth look at how the current economic downturn has intensified the deprivations children were already experiencing in many developing countries.

Declining heights-for-age in some Zambian provinces, increase in the incidence of low birth weight babies and of children given up by their parents because of poverty in parts of Sao Paulo, Brazil, the doubling of the number of children treated for severe malnutrition in Costa Rica, and an increase in infant mortality rates in some poorer Indian regions are amongst the many consequences of the current recession that the report records.

But the story is not one of unmitigated world-wide woes: the authors document continuing improvement, albeit at diminished rates, in some critical areas such as Infant Mortality Rates, school attendances and health care outreach in many countries. Encouraging also has been the greater financial commitment to child welfare despite reduced national incomes in countries such as the Republic of Korea and Cuba. The report nevertheless warns quite categorically that the situation of children is deteriorating, and could assume catastrophic proportions if action is not initiated soon on remedial measures.

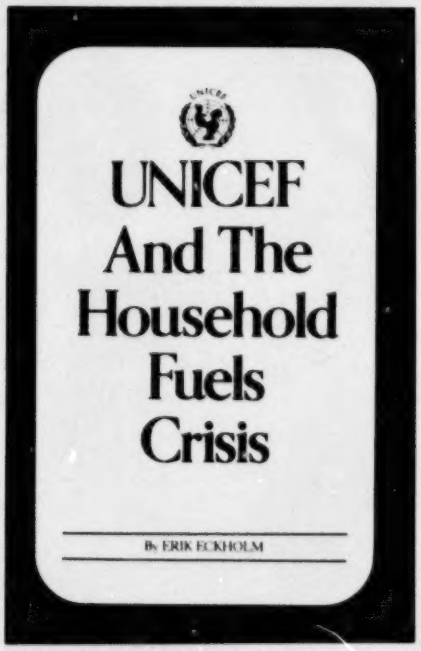
In the long run, however, the report asserts that any real improvement will only come through fundamental changes in the way the world perceives actions promoting human welfare. As it correctly concludes, "We are used to describing the flow of money and wealth, with their effects on human life seen as incidental consequences. If we start, instead, with men, women and children as what matters, we trace the same international links in a wholly new light: the economic numbers become the background against which the human consequences are to be weighed. When this glimpse of another reality becomes an accepted and legitimate pre-occupation of international and national economic policy, we may take more hope for the welfare and future of the world's children."

An abbreviated version of the study will be available mid-December from UNICEF's Information Division in New York and Geneva.

Occasional papers from UNICEF

"UNICEF and the Household Fuels Crisis," a booklet by Erik Eckholm discussed on page 4, is the second in a series of "occasional papers" on topical subjects that form the basis of a new UNICEF publication programme. The first one, "Current Views on Nutrition Strategies" by Hossein Ghassemi, reported on what can now be termed a "historic" meeting, organized at Mr. Grant's initiative in September last year, of leading international nutrition experts. The meeting helped crystallize the ideas and measures which are the heart of the Child Health Revolution.

"Urban Basic Services: Reaching Children and Women of the Urban Poor,"



will be the third publication in the series. An illustrated version of the "Urban paper" presented to the UNICEF Executive Board last year, it will be published in English, French, Spanish, Arabic, Portuguese (for Brazil and some African countries) and Chinese editions. The English edition, the first one to be printed, will be available by the end of November. □

New hope for low birthweight babies

In her continuing commitment to children Liv Ullmann travels around the world as a UNICEF Goodwill Ambassador looking for ways to draw international attention to the needs of children, and at the same time to publicize innovative measures initiated by third world countries to advance the welfare of their children.

One such initiative that particularly impressed and moved her was a revolutionary method devised by a group of paediatricians in Colombia to help sustain life in prematurely born, dangerously low birth-weight babies. Conventional treatment requires the use of incubators, which are of course much too expensive for widespread use in poor communities. But at Bogota's Mother and Child Institute of San Juan de Dios Hospital, the paediatricians "pack" the infants close to the mothers' chests, under blouse or sweater right next to the breast, to allow them to suck it any time they wish.

"When the baby is breastfed, it has the immunological protection of the mother through her milk," Dr. Rey who is head of the paediatric team, told Ms. Ullmann. "In addition, this eliminates the infection dangers a baby is exposed to when it is suddenly taken out of the incubator's sterile environment and placed in the generally unhygienic surroundings of a poor home. What's more," he continued, In an incubator the baby is too quiet. It is not stimulated in any way. No voice, no sounds, no touch–just glass. Love, affection and stimulus are very important for the newborn child, and one of the reasons my programme is so successful is that the mother learns these simple things."

Before Dr. Rey introduced this technique in 1979, all premature babies born in the hospital weighing less than two pounds (1 kg.) died. Now three out of four are saved. And of those weighing over 1500 grammes at birth, practically all survive.

ICEF 9342/Cerni

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